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ABSTRACT

Practitioner papers and research papers on higher education planning and budgeting are presented. "Before the Roof Caves In: A Predictive Model for Physical Plant Renewal" by Frederick M. Biedenweg and Robert E. Hutson outlines a systematic approach that was used at Stanford University to predict the associated costs of physical plant maintenance over a period of years. "Academic Planning in the California State University and Colleges: The Aftermath of Proposition 13," by Sally K. Loyd describes the proposed and actual budgetary impacts of Proposition 13 on the California State University and Colleges and how the system responded to these impacts. In "Faculty Early Retirement: A Planning and Budgeting Issue in Higher Education," Barbara A. Mitchell outlines the steps taken in Oregon to determine faculty members' probabilities for retirement, the cost of alternative plans, and administrative, legal, and other concerns. "Policy-Impact Analysis: An Approach to Planning and Budgeting in Higher Education" by E. Raymond Hackett and James L. Morrison describes a four-stage model involving monitoring, forecasting, goal setting, and policy analysis and implementation. LaRue Tone Hosmer, in "Planning, Control and Motivation Systems: A Conceptual Framework," explains how planning, control, and motivation systems should not be considered separate entities in higher education. "Strategic Planning in the Small, Private, Liberal Arts College," by Raymond L. Siren reviews the literature on strategic planning, and "Doctoral Programs and the Labor Market, or How Should We Respond to the 'Ph.D. Glut'?" by William Zumeta presents an approach to policy analysis in support of decisions about doctoral programs in state universities. (Author/SW)

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Higher Education Planning and Budgeting: Ideas for the 80s

Contributed papers for an NCHEMS Competition on state and institutional financing

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Preface

Over the past ten years there have been many changes occurring in higher education. These changes are most likely to continue through the 1980s. The decrease in the size of traditional college-age cohort indicates that some institutions may expect either a decline in their enrollments or a change in their student mix. Funding for public institutions is becoming tighter as tax revenues become scarcer. The new Federal administration has also brought about new policies in higher education.

For higher education administrators responsible for the planning and budgeting functions, these changes make their jobs increasingly difficult. The decisionmaking processes become more complex and the decisions more painful. The purpose of this document is to serve as a mechanism through which administrators and researchers in higher education can share their ideas on making decisions in hopes that others might benefit from their ideas. The document itself is a compilation of papers that were submitted in response to a competition sponsored by NCHEMS. The purpose of the competition was to identify ideas relevant to higher-education planning and budgeting.

The first category of competition was sponsored for practicing administrators in a higher education institution, in a state-level higher education agency, or in a state's executive or legislative branch.

The first paper in this category, "Before the Roof Caves In: A Predictive Model for Physical Plant Renewal" by Frederick M. Biedenweg and Robert E. Hutson, outlines a systematic approach that was used at Stanford University to predict the associated cost of physical plant maintenance over a period of years. The basis of the model developed is that the components or subsystems of a facility have an identifiable life expectancy and will require replacement after a predictable period of time. By using different life-length and cost estimates, a sensitivity analysis is performed and a range of funding requirements derived. This analysis provides the administrator with a tool for allocating resources for specific needs and for identifying the future renewal and replacement, or maintenance requirements of the physical plant.

"Academic Planning in the California State University and Colleges: The Aftermath of Proposition 13" by Sally K. Loyd describes the proposed and actual budgetary impacts of Proposition 13 on the California State University and Colleges (CSUC) and how the CSUC system responded to these impacts. In addition, this paper examines the recommendation made by an advisory committee on Academic Planning and Program Review to concentrate on a mission-based planning system and describes how this system was used by the CSUC.

The final practitioner paper is "Faculty Early Retirement: A Planning and Budgeting Issue in Higher Education" by Barbara A. Mitchell. The steps that were taken in Oregon in determining faculty members' probabilities for retirement, the cost of alternative early retirement plans, and the implications in terms of feasibility related to administrative, legal, political and market factors are described in this paper.

The second category of competition was for faculty members, research associates, or graduate students in academic programs related to higher education management, or researchers with national or regional higher education associations.

The first paper in the research category, "Policy-Impact Analysis: An Approach to Planning and Budgeting in Higher Education" by E. Raymond Hackett and James L. Morrison, presents a policy-impact analysis model for developing and assessing policies at the state level, consistent with the fiscal realities of the 1980s and the power structures in higher education. This paper describes the four stages in the policy-impact model: monitoring, forecasting, goal setting, and policy analysis and implementation.

"Planning, Control and Motivation Systems: A Conceptual Framework" by LaRue Tone Hosmer explains how planning, control and motivation systems should not be considered separate entities in higher education, but part of a single system. The single system framework will help ensure that planning, control and motivation procedures are consistent at all levels of an institution.

The third research paper, "Strategic Planning in the Small, Private, Liberal Arts College" by Raymond L. Siren, reviews the literature on strategic planning. This paper indicates that the literature on higher education planning is prescriptive in nature and prescribes the application of an industrial planning model. Siren surveys small, private, liberal arts colleges on their planning practices and finds support for the applicability of an industrial planning model both in formal, highly organized planning systems and in informal, unstructured planning systems.

The last paper in the research category, "Doctoral Programs and the Labor Market, or How Should We Respond to the 'Ph.D. Glut'?" by William Zumeta, presents an approach to policy analysis in support of decisions about doctoral programs in state universities. Zumeta's approach is derived from the cost-benefit model of microeconomics. Material from a study of the policy environment of doctoral-level education at the University of California is used to illustrate the utility and application of the approach.

Acknowledgments

This is the second year that the NCHEMS Planning and Financing Program has sponsored a contributed-paper competition in conjunction with the University of Arizona Conference on Higher Education Finance. The papers in this document have been submitted as part of this conference. The editor would like to acknowledge the work of each of the contributing authors who played a major role in making this publication possible.

Special thanks are also extended to Jack Bartram of the University of Colorado, Anna Neumann of the University of Michigan, and within NCHEMS, Richard Allen, Ellen Chaffee, Douglas Collier, and Rodolfo Garcia for their efforts in reviewing and judging the papers submitted for the Planning and Financing Program's paper competition. In addition, thanks are also given to Paula Dressler who managed the compilation and production of this document.

Practitioner Papers

Before the Roof Caves In:
A Predictive Model for Physical Plant Renewal

by:

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and

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Before the Roof Caves In:
A Predictive Model for Physical Plant Renewal

The Problem

Higher education has experienced a tremendous expansion since the 1950's. Stanford University typifies this growth pattern with over 75% of its existing physical plant being constructed since 1955. The emphasis during this growth period was expansion to meet increasing academic demands.

One side effect of this rapid growth has been the creation of an increasingly large obligation for the future renewal and replacement of the physical plant. Often this need for plant renewal has not been fully realized or accepted. This has been especially true in recent periods of declining resources and has resulted in an inadvertent erosion of University assets since maintenance (or reinvestment in the physical plant) is usually the first budget item to be cut. If this erosion continues unchecked, many colleges and universities may soon find themselves in a position where the roof is literally ready to cave in.

While the competent administrator does not knowingly allow these conditions to develop, he or she is frequently hindered by an incomplete understanding of the problem. This is not due to negligence on the part of the administrator but has developed as a result of:

--- The difficulty in determining exactly what constitutes maintenance.

--- The lack of an accepted quantitative method for evaluating and measuring maintenance needs.

--- The lack of a consistent long range program which facilitates measuring results achieved vs. resources allocated.

These factors have made planning and budgeting for maintenance or renewal of the physical plant an extremely difficult issue to address and resolve.

In this paper we will present a quantitative method, or model, developed at Stanford University, which addresses both the short and long term needs of the physical plant in a programmatic manner. It allows the administrator to accurately assess the maintenance program in conjunction with academic and construction programs for funding resources.

Maintenance Programs and Methodologies

Methodologies for defining maintenance needs and programs are traditionally one of the three following types:

--- Straight Line or Historical Funding - The previous year's budget base is incremented by a certain percentage annually to compensate for identified changes such as inflation, additional personnel, etc.

--- Identification of Needs Based on Physical Survey - A comprehensive facilities audit is conducted to identify and quantify all current maintenance deficiencies.

--- Formula Funding - Annual maintenance needs are expressed in terms of cost per square foot, number of full time employees per square foot, or a certain percentage of current physical plant value. This amount is to be reinvested annually.

Each of these methods has one or more major deficiencies. The straight line or historical funding does not match funding levels against identified needs. Additionally, there is no way in which the established base which is being incremented can be validated.

Physical survey provides an extremely accurate assessment of immediate needs but has no provisions for identifying long term requirements, an essential ingredient to the planning and budgeting administration.

Formula budgeting is quantitatively based and can easily be utilized to project future needs. However, the formula method only provides a general overview and cannot address the needs of a specific physical plant. The validity of this methodology becomes even more questionable in view of the tremendous variety in age of facilities, usage, construction materials, and construction methods.

In addition, both historical and formula funding assume that the plant renewal requirements will occur at a constant rate. This assumption seems inappropriate due to the identifiable life cycles of both facilities and their installed subsystems. These cycles are critical in determining the necessary, and varying, funding levels for future years.

Developing a Conceptual Framework

As part of the planning and budgeting process, administrators at Stanford University identified the need for a program which would accurately identify the future capital requirements necessary for renewal and replacement of the physical plant. The need for such a program was accentuated by the previously outlined fact that over 75% of Stanford's existing physical plant had been constructed since 1955. As this large group of facilities is now entering its first major (and expensive) stages of deterioration, the need for funding of renewal and replacement are becoming increasingly apparent. It has also raised extreme concern as to the total magnitude of liabilities in coming years.

To address this need, a framework was established within which the problems could be resolved. The basis of this framework is that there exist actuarially predictable cycles for facility renewal and replacement (i.e., the components or subsystems of a facility, such as: plumbing, roofs, electrical, heating, ventilation, air conditioning systems, installed equipment, etc., have identifiable life expectancies and will require replacement after predictable periods of time). These cycles will continue to repeat themselves for as long as the facility continues to serve its intended functions. Of extreme importance to the planning and budgeting administrator is the magnitude (constant dollars) of these replacement requirements and at what time in the future they will occur. The associated replacement costs at these specified frequencies will approximate the annual reinvestment necessary to maintain the physical plant.

The development of this conceptual framework was accomplished by a special task force. The members were drawn from various departments within the University, each representing a department which had a concern and interest in maintenance of the physical plant. This approach proved to be extremely beneficial because it brought together the financial, planning, and facilities departments and their respective viewpoints and expertise. An additional benefit derived from the task force approach was that it fostered a widespread understanding and acceptance of the results produced.

The task force began development on the established framework by identifying the features which would have an impact on facility and system wear-out, and the resulting replacement/renewal costs. The identified features and underlying assumptions on which each is based are as follows:

--- Facility Subsystems - That the quantity and type of installed subsystems (such as plumbing, electrical, . . .) within a facility will determine future requirements.

--- Facility Type - That the type of subsystems and associated costs vary with facility type.

--- Subsystem Life Cycles - That the predictable life of a subsystem will determine the time at which future requirement occurs.

--- Subsystem Cost - That the unit replacement cost will determine the cost of future requirements.

--- Date of Facility Construction - That the future point in time at which requirements will occur is determined by the "birthdate" of the facility and subsystems.

Developing the Framework

In order to complete the established conceptual framework, it was necessary to further define and quantify the identified features or variables. This was accomplished by an analysis of the existing physical plant and by researching available data.

As the objective was to forecast future renewal and replacement requirements at Stanford, the values assigned to the variables reflected actual conditions at Stanford. This tailoring of the data provides a higher degree of accuracy in forecasting by being specifically representative of future requirements at Stanford. For example, subsystem cost is representative of the construction standards employed by Stanford. Subsystem life cycles similarly reflect the expected usable life experienced at Stanford.

Utilizing data of this nature, it was possible to model accurately Stanford's physical plant and to simulate the future renewal/replacement requirements over time. This guided the development of the data to a format that would serve as input to a mathematical model. Each variable and resulting data set is discussed in detail in order to outline the methodology utilized for developing the data.

Again the use of a task force proved useful because it was able to draw on engineering, construction, and maintenance expertise.

Facility Subsystems

Facility subsystems were identified as the individual parts/components or subsystems of a facility such as electrical systems, elevators, roofs, etc. The criteria established for identifying the subsystems were as follows:

--- Each subsystem has a unique estimatable useful life.

--- The subsystems taken in total would constitute all parts of a facility that could eventually wear out or need replacement.

--- Published data on subsystem cost and performance must be available.

Based on this selection criteria the subsystems were identified as outlined in Figure 1.

Facility Type

Based on the stated assumption that the type of subsystems will vary with facility type, the physical plant was analyzed to determine the functional utilization of facilities in general. Functional use was determined on a "building by building" basis by classifying each building as to its primary designated use. Multi-functional use of facilities was considered but ignored during the initial classification. This resulted in the identification of nine functional space types:

Research Laboratories
Teaching Laboratories
Offices
Classrooms
Library
Athletics
Residences
Patient Care
Other (Misc. Storage, etc.)

Each of the identified space types was then analyzed to determine if it had subsystems that would rate it significantly different from the others. This analysis reduced the nine initial categories to five:

Research/Teaching Laboratories
Office/Classrooms/Athletics/Libraries
Patient Care
Storage Buildings and Others with Minimal Systems
Residential

The validity of this classification was then tested by selecting a representative sample from each facility category and analyzing the nature of the systems actually installed. While this analysis validated the above classification system, it also revealed the need to separately address facilities partially used as laboratories. This was due to the fact that the systems inherent in laboratories would significantly influence future renewal/replacement cost. Further analysis by percent of space utilized as laboratory vs. the system design of the facility revealed 30% to be the point at which functional use as a laboratory significantly influenced the subsystem design and resulting cost. Therefore, any facility which had at least 30% of its space designated as laboratory use was functionally classified as laboratory space.

Figure 1

Components Included in Building Subsystems

Building Subsystems	Includes
Foundations & Major Vertical, Floor, and Roof Structures	Excavation, Piling, Columns, Load, Bearing & Shear Walls or Bracing, Floor Slabs, Beams & Girders Above Grade
Roofing	Roofs, Flashing, Guttering and Downspouts
Exterior Cladding	Skylights, Non Structural Skin, Insulation, External Doors and Windows*
Interior Partitions	Non Load Bearing Walls, Interior Doors & Windows, Railing, Sound Insulation
Interior Finishings	Floor Coverings, Plaster Work, Trim, Drapes, Paint, Light Fixtures
Elevators	Dumbwaiters, Linen Chutes, Escalators
Plumbing	Hot & Cold Water, Steam, Gas, Air Vacuum Lines
HVAC - Moving	Fans, Heating & Cooling Coils, Motors, Cooling Towers
HVAC - Static	Duct Work, Diffusers, Registers
Electrical - Moving	Switches, Relays, Circuit Breakers
Electrical - Static	Fuses, Wiring
Fire Protection	Automatic Sprinklers

Special Equipment and Miscellaneous	Built In Appliances (Ranges, Ovens) & Bookcases, Cabinet Work, Folding Room Dividers, Laboratory Tables, Special Work Areas, Etc.

* Virtually all permanent academic facilities at Stanford are natural finish masonry construction. Hence, the external painting requirement was considered insignificant.

Subsystem Life Cycles

Subsystem Life Cycles represent the useful life of the subsystem. The initial assumption applied to this variable was that the identified subsystem had been, and would continue to receive a "normal" level of maintenance. This restriction was made in order to maintain a reasonable degree of simplicity and to facilitate the use of industry life cycle standards as a starting point. Initial life cycle data for each of the identified subsystems was compiled from various professional handbooks [1,2,3,4,5,6,]. This data represented a composite of engineering, maintenance, Internal Revenue System and Treasury Department sources. Items whose average useful life was assessed at one year or less were considered as an operational type of maintenance cost and were not included. The assessed life cycles were then analyzed in relation to historical experience at Stanford.

This comparison produced a sizeable discrepancy in that the identified subsystems at Stanford have experienced a considerably greater life span than the published data values would indicate. This was attributed to two factors: the tax advantage in private business of high value and rapid depreciation, and the quality of construction standards at Stanford, which promote a longer useful life. To assist in resolving this discrepancy, additional estimates of system lives were obtained from qualified "experts" utilizing the Delphi technique. In this technique, experts are independently polled by a series of interactive questionnaires. Finally all data sets were analyzed by a separate panel of experts. Due to the variability of the types of subsystems, the conditions to which they were exposed and under which they operated, there continued to be a large range in the life cycle estimates. This was resolved by assigning pessimistic, optimistic and likely life cycle estimates to each subsystem. The panel also felt that some of the subsystems would not be subject to replacement under certain conditions. In this situation the useful life was designated as infinite. Figure 2 represents the final values assigned to each of the subsystems.

Subsystem Cost

The Subsystem Cost was defined as the unit replacement cost for the identified subsystems. Due to the realization that the functional use of a facility type may determine the subsystem replacement cost, a separate unit replacement cost for each subsystem in each facility type was developed. For example, the mechanical systems in a research lab would be much more sophisticated and costly to replace than the mechanical system for classroom spaces.

The subsystem cost data was initially derived from various construction cost indexes. These costs in turn were compared to a historical data base of Stanford construction cost data. This was the tailoring process that would again make the data representative of expected cost at Stanford. A final adjustment was made by applying a multiplier factor of 1.3[1] to all data to reflect replacement cost as opposed to new construction cost. Figure 3 reflects the derived unit cost of subsystems by facility type.

Figure 2

Subsystem Life Estimates

Building Subsystem	Average Useful Life With Maintenance Program Years		
	Pessimistic	Likely	Optimistic
Foundations & Major Vertical Floor, and Roof Structures	-	-	-
Roofing	15	30	40
Exterior Cladding	100	-	-
Interior Partitions	75	100	-
Interior Finishes	5	10	15
Elevators	20	40	75
Plumbing	30	50	80
HVAC - Moving	10	15	25
HVAC - Static	30	50	75
Electrical - Moving	20	35	50
Electrical - Static	30	50	75
Fire Protection	60	80	100
Special Equipment and Miscellaneous	10	30	50

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[1] The factor of 1.3 was derived by comparing new construction cost with remodeling cost, [7] and by polling independent contractors to assess the additive cost of demolition, removal and reinstallation difficulties encountered during replacement.

FIGURE 3

Average Unit Renewal/Replacement Cost*
by
Building Subsystem

Building Subsystem	Patient Care	High Intensity Labs	Library, Office Classroom, Low Intensity Labs, Athletics	Residential	Miscellaneous
Foundations & Major Vertical, Floor and Roof Structures	$ 29.52	$ 34.65	$ 33.70	$ 19.10	$ 20.80
Roofing	2.30	3.20	3.50	4.10	2.85
Ext. Cladding	19.68	9.55	10.40	11.50	8.55
Interior Partitions	13.94	9.55	7.50	12.80	1.75
Interior Finishes	16.40	7.70	6.20	9.80	3.65
Elevators	9.70	1.65	3.75	0.20	-0-
Plumbing	11.97	13.15	3.00	6.30	2.30
HVAC - Moving	13.61	12.90	6.65	3.30	1.65
HVAC - Static	13.61	12.90	6.65	3.30	1.65
Electrical - Moving	15.38	14.70	7.40	4.55	4.60
Electrical - Static	6.58	6.25	3.20	2.00	1.95
Fire Protection	1.80	2.05	2.50	2.15	2.25
Special Equipment & Misc.	9.51	14.95	5.60	8.60	0.60
Total Replacement Cost w/o Structural Shell	$134.48	$108.55	$ 66.35	$ 68.60	$ 31.80
Total w/Structural Shell	$164.00	$143.20	$100.05	$ 87.70	$ 52.60
Estimated Maximum Error To "Real" Average Total Replacement Costs	± 20%	± 30%	± 20%	± 20%	± 20%

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* All costs are measured in $\$/\text{Ft}^2$ as of September 1980.

Date of Facility Construction

The established concept is one of cyclic renewal and replacement. Based on this the "birthdate" of the facility and subsystems becomes the starting point on which to base the established subsystem life cycles. "Birthdates" or age cohorts were established by five year increments beginning with initial construction in 1891 up to the present date. The construction date of each facility (by type) was identified along with the square footage of that facility. The question of modernization was addressed by establishing the age cohort at the remodeling date. This was done only when the facility had been significantly remodeled by the installation of new subsystems. The resulting data is represented by Figure 4.

Framework to Model: An Example

The data developed, which had been tailored to reflect the expected performance and cost of the physical plant, could now be utilized to simulate the wear-out and resulting replacement cost of Stanford's physical plant. Due to the large number of facilities and variables involved, a computer model was constructed to perform the detailed calculations.

The mechanics of the model may best be illustrated by a simplified example using a single building. Figure 5 illustrates the life cycles and resulting costs of a building built in 1950 occupying 10,000 square feet. The example addresses only four subsystems: roofs, interior partitions, HVAC and other. These subsystems have life lengths of 40, 30, 20 and 10 years, respectively. The associated cost of replacing these subsystems is assumed to be $12, $5, $10, and $2 per square foot (in constant dollars), respectively. This produces a $120,000 replacement requirement each time the roof fails, a $50,000 requirement each time the interior partitions wear out, a $100,000 requirement each time the HVAC systems need replacement, and a $20,000 requirement as other items fail. These values are found by multiplying the cost per square foot by the total number of square feet in the building (10,000 sq. ft.).

The life lengths are then used to determine where the replacement costs fit into the table. For instance, roofs are assumed to fail every 40 years. Since the building was built in 1950, the roof will fail for the first time in 1990 (1950 + 40) and every 40 years thereafter (i.e., 2030 and 2070). Similar calculations were made for the other subsystems in the example.

After each of these values has been incorporated into the table, the total for each year was found by summing the appropriate row. For instance, the year 2010 row includes $50,000 for interior partitions, $100,000 for HVAC and $20,000 for other, adding up to a total projected maintenance requirement of $170,000 for the year 2010.

The Stanford University physical plant has a total of 218 academic buildings which were built between 1891 and the present. For each of these buildings a table similar to the previous example was constructed. These tables were constructed using 5 year intervals and contain the subsystems actually installed with each building. The tables were then summed to calculate the total expected cost for the physical plant renewal/replacement at Stanford University over the next 100 years.

FIGURE 4

STANFORD BUILDING CATEGORIES

By Life and Age Cohort

	COHORT	High Intensity Labs A	Library, Office Classroom, Low Intensity Labs, Athletics B	Patient Care C	Misc. D	Residential R
1	1891-1895	3- 8,603	5- 126,031			1- 780
2	1896-1900	1- 1,052	1- 2,746			1- 527
3	1901-1905	2- 69,373	8- 124,311			
4	1906-1910	1- 38,871	1- 6,703			
5	1911-1915		2- 27,653			
6	1916-1920		12- 187,514	1- 624	2- 2,400	3- 18,482
7	1921-1925				1- 3,400	
8	1926-1930	2- 18,506	2- 10,200		2- 21,529	
9	1931-1935				1- 5,408	
10	1936-1940	1- 1,032	4- 254,828		6- 17,173	3- 12,145
11	1941-1945	NOTHING BUILT				
12	1946-1950	2- 45,891	3- 83,925			
13	1951-1955	2- 110,316	3- 26,413		2- 900	
14	1956-1960	4- 72,417	14- 259,594		3- 11,177	1- 3,292
15	1961-1965	5- 176,527	17- 415,283		6- 13,608	1- 2,177
16	1966-1970	8- 489,743	22- 971,871	1- 26,538		1- 858
17	1971-1975	3- 17,108	31- 208,497		2- 2,398	1- 1,000
18	1976-pres	7- 196,077	13- 829,648			

Note: In each column, the digit to the left of the dash indicates the number of buildings built during that cohort; the digits to the right of the dash indicate the square footage.

Figure 5

A Simplified Example *

Year	Roofs 40 yr life $12/sq ft	Int. Part. 30 yr life $5/sq ft	HVAC 20 yr life $10/sq ft	Other 10 yr life $2/sq ft	Total
1960				$20	$20
1970			$100	$20	$120
1980		$50		$20	$ 70
1990	$120		$100	$20	$240
2000				$20	$20
2010		$50	$100	$20	$170
2020				$20	$20
2030	$120		$100	$20	$240
2040		$50		$20	$ 70
2050			$100	$20	$120
2060				$20	$20
2070	$120	$50	$100	$20	$290
2080				$20	$20

All dollar values are in thousands of 1980 dollars.

*This example assumes that in 1950 a building with the above characteristics was built. It also assumes that the building contains 10,000 square feet.

Inspecting the Results

As with any results derived from a model, the first consideration is "Are the results reasonable?". This can only be answered after the results have been carefully inspected, the important variables identified, and the relative size of the variables compared. To help with this inspection, tables like Figure 6 were prepared. It represents the sum of the tables for each individual building and identifies the total expected cost in millions (1980 dollars) for each of the categories listed by cohort. The bottom two rows are the column averages and the percent of total costs, respectively.

A quick inspection of the bottom line indicates that the most expensive subsystems are interior finishings with 31% for the total cost, HVAC with 26%, electrical with 14% and special equipment with 10%. The other subsystems each represent less than 10% of the total expected cost.

These values were then analyzed to determine whether or not they were reasonable. This was accomplished by reexamining past wear-out data to determine relative costs. The conclusions were that interior finishing and special equipment were slightly higher than expected but justifiable due to the prevalent practice of unreported supplemental funding for each of these categories.

Overall, it was concluded that the results were very reasonable. However, due to the fact that both interior finishings and special equipment were potentially deferrable they were separated from the other costs in the final projections. Identification in this manner would allow additional funding options. This option to defer is not available in the other categories such as roofs or electrical systems, as failure of these subsystems would mandate immediate replacement.

A graphical representation of total cost, with interior finishings and special equipment separated, was then prepared. The results are illustrated by Figure 7, "Facilities Forecast - Likely." The "likely" correlates to the likely estimates of subsystem life lengths. Examining this graph reveals that the total expected annual costs will increase relatively slowly until the early 1990's at which point a sharp increase is expected. This increase occurs even after disregarding the two deferrable subsystems discussed previously.

This large projected replacement requirement is supported by the tremendous growth that occurred in Stanford's physical plant from 1955 to 1970. Over 50% of the existing plant was constructed during this fifteen year period. It is reasonable that Stanford will be faced with a very large liability starting in 1990 as this group of facilities begins to require extensive renewal/replacement.

The results obtained were also compared to the results of other methodologies for maintenance budgeting. In particular, they were matched against the most commonly accepted formula funding methodology, that of utilizing a fixed percentage of the current replacement value (CRV) of the plant. While different sources cite various values ranging up to 3.0% of the plant CRV [8], the most commonly cited value for budgeting purposes is an annual maintenance budget of 1.1% of the plant CRV [9].

Expressing the Stanford University results of Figure 7 in CRV percentages yielded values from 1.5% to 2.6% of the Stanford plant CRV. These values are well within the range of the cited values. While the percent of CRV is a general benchmark, the model provides a more accurate forecast of future conditions (life cycle, building complexity, construction materials and cost) at a specific location.

Sensitivity Analysis

Sensitivity analysis was performed by varying the subsystem life length values. This was accomplished by using the appropriate optimistic and pessimistic life lengths values discussed earlier and found in Figure 2. Figures 8 and 9 show the respective results of these Facilities Forecasts. They help complete the picture of potential costs to the University.

As expected, the comparisons between Figures 7, 8 and 9 indicate that the greatest similarity exists between the likely and optimistic forecast. This is a result of the values assigned to the subsystem life cycles based on past performance at Stanford.

The likely and optimistic scenarios are not wildly different indicating that costs are unlikely to be much less than those indicated in the likely forecast. On the other hand, the large difference between the likely and pessimistic scenarios indicate that the potential costs could be considerably larger than expected.

The Cyclical Nature of the Forecast

Upon initial inspection, the extremely cyclical nature of the expected costs, as depicted by Figure 7, was difficult to interpret. However, further analysis revealed that Stanford had built its buildings in cycles. Comparing the total buildings constructed in the first half of decades with those constructed in the last half of decades (i.e., 1930-35, 1960-65, . . . vs. 1935-40, 1965-70, . . .) revealed the astounding fact that over 70% of Stanford's buildings were constructed in the last half of each decade. This surprising discovery, in conjunction with the known fact that over 75% of the buildings were constructed post 1955, explained the cyclical nature.

Discovering the reason, however, does not solve the problem of planning and budgeting for such large fluctuations and it was decided to smooth the model output for budget planning purposes. The results of this smoothing are illustrated by Figure 10. The smoothing was accomplished by using a two cohort moving average. The effect this smoothing had on the assumptions is the cost of replacing a worn out subsystem is now being spread over the ten year interval surrounding the expected wear-out date rather than the five year interval used in Figures 7, 8, and 9.

Note that in Figure 10 the cycles still do occur, but they are greatly reduced. It is the feelings of the task force that these cycles are inherent in the building data and any further smoothing would be unrealistic.

Figure 6

Total Cost Over 5-Year Period in Millions of 1980 $

Year	Roofs	Finish	Plumb	HVAC	Elect	Sp. Eqp	Other*	Total
1980	1.2	15.4	0.2	5.8	0.4	2.0	1.7	26.7
1985	1.0	8.1	0.0	12.4	1.2	1.5	1.1	25.3
1990	1.3	21.8	0.9	4.6	3.4	2.3	1.0	35.2
1995	2.7	8.1	0.4	13.7	3.0	4.5	2.0	34.3
2000	5.9	21.8	0.5	13.3	6.3	11.6	3.2	62.7
2005	0.9	8.1	0.9	5.3	12.9	1.6	4.9	34.6
2010	4.7	21.8	1.3	15.7	6.4	9.1	8.5	67.4
2015	1.0	8.1	2.1	16.5	10.9	1.5	2.4	42.4
2020	1.3	21.8	7.1	15.0	6.9	2.3	9.3	63.7
2025	2.7	8.1	0.9	15.0	3.3	4.5	1.1	35.6
2030	5.9	21.8	4.8	20.2	6.4	11.6	1.2	71.9
2035	0.9	8.1	0.0	4.0	5.9	1.6	1.0	21.5
2040	4.7	21.8	0.9	14.0	12.8	9.1	5.3	68.5
2045	1.0	8.1	0.4	12.7	5.6	1.5	3.6	32.9
2050	1.3	21.8	0.5	4.9	9.3	2.3	9.1	49.1
2055	2.7	8.1	0.9	14.6	2.2	4.5	3.2	36.1
2060	5.9	21.8	1.3	14.8	3.8	11.6	10.0	69.2
2065	0.9	8.1	2.1	8.1	4.6	1.6	5.5	30.9
2070	4.7	21.8	7.1	24.4	11.7	9.1	11.8	90.5
2075	1.0	8.1	0.9	14.0	12.7	1.5	2.7	40.9
2080	1.3	21.8	4.8	11.7	9.0	2.3	11.1	61.9
Ave.	2.5	15.0	1.8	12.4	6.6	4.7	4.7	47.7
%	5%	31%	4%	26%	14%	10%	10%	100%

*Other includes foundations, interior partitions, elevators, fire protection, and exterior cladding.

FIGURE 7

FACILITIES FORECAST - LIKELY

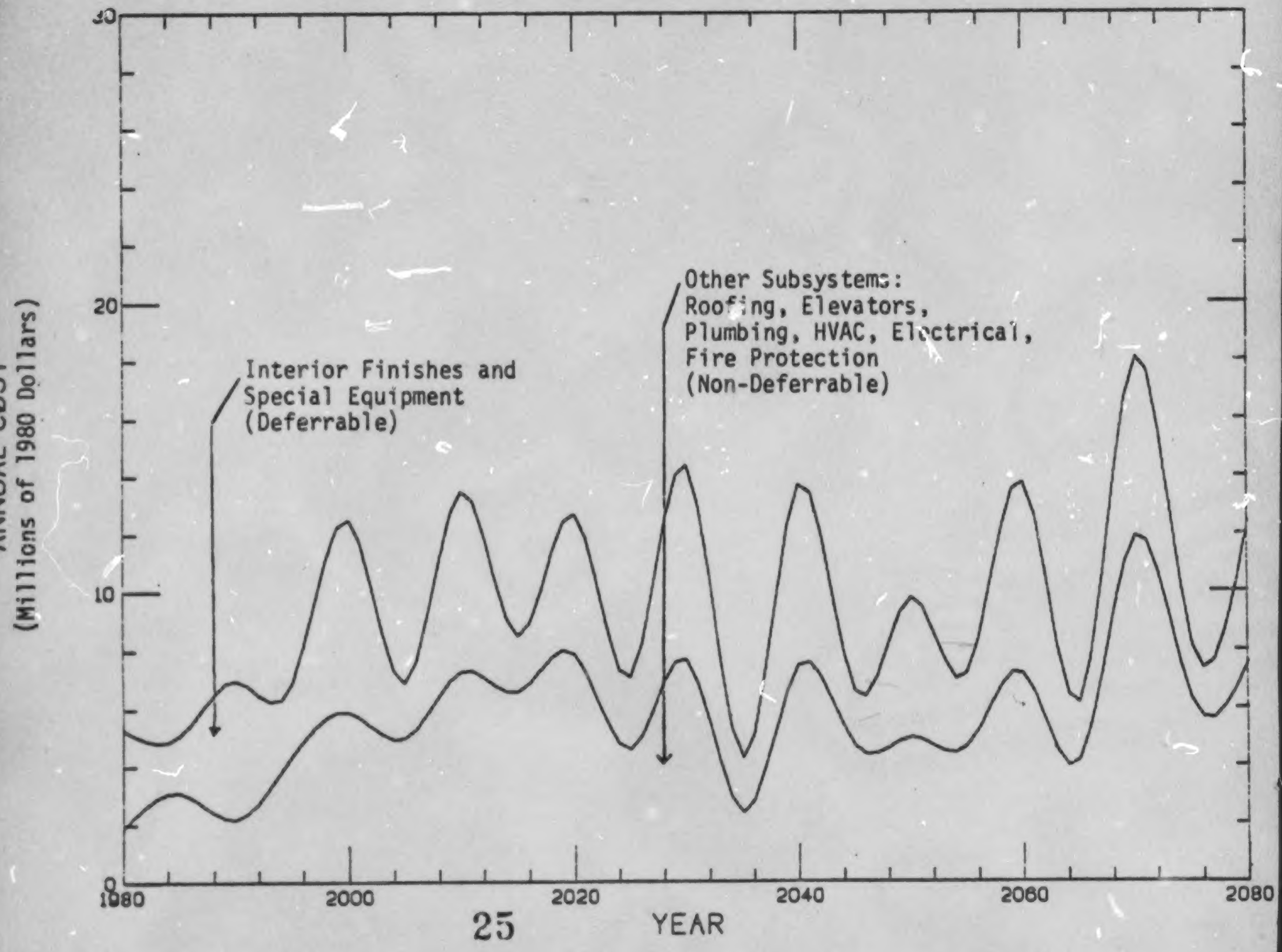


FIGURE 8

FACILITIES FORECAST - OPTIMISTIC

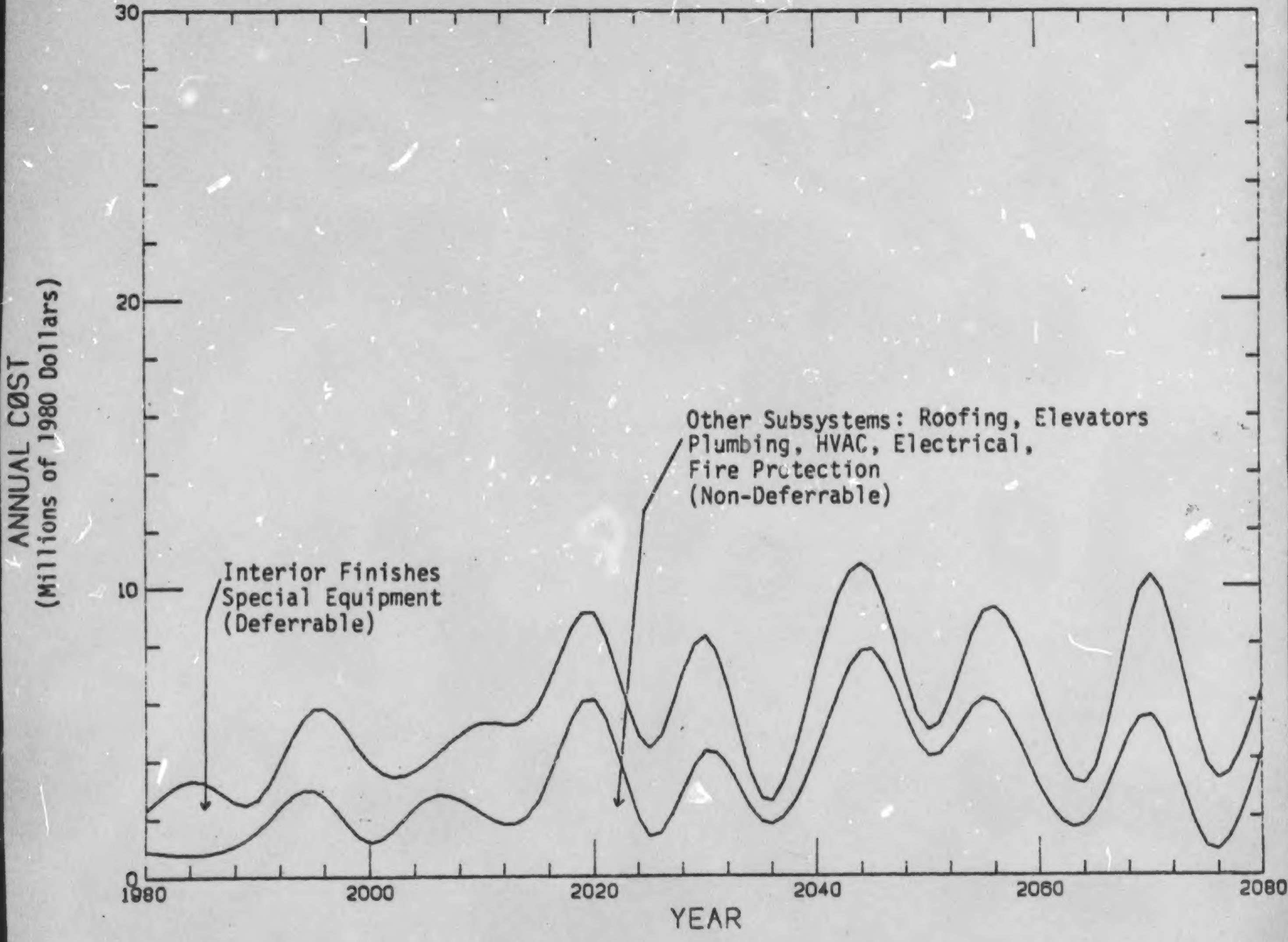


FIGURE 9

FACILITIES FORECAST - PESSIMISTIC

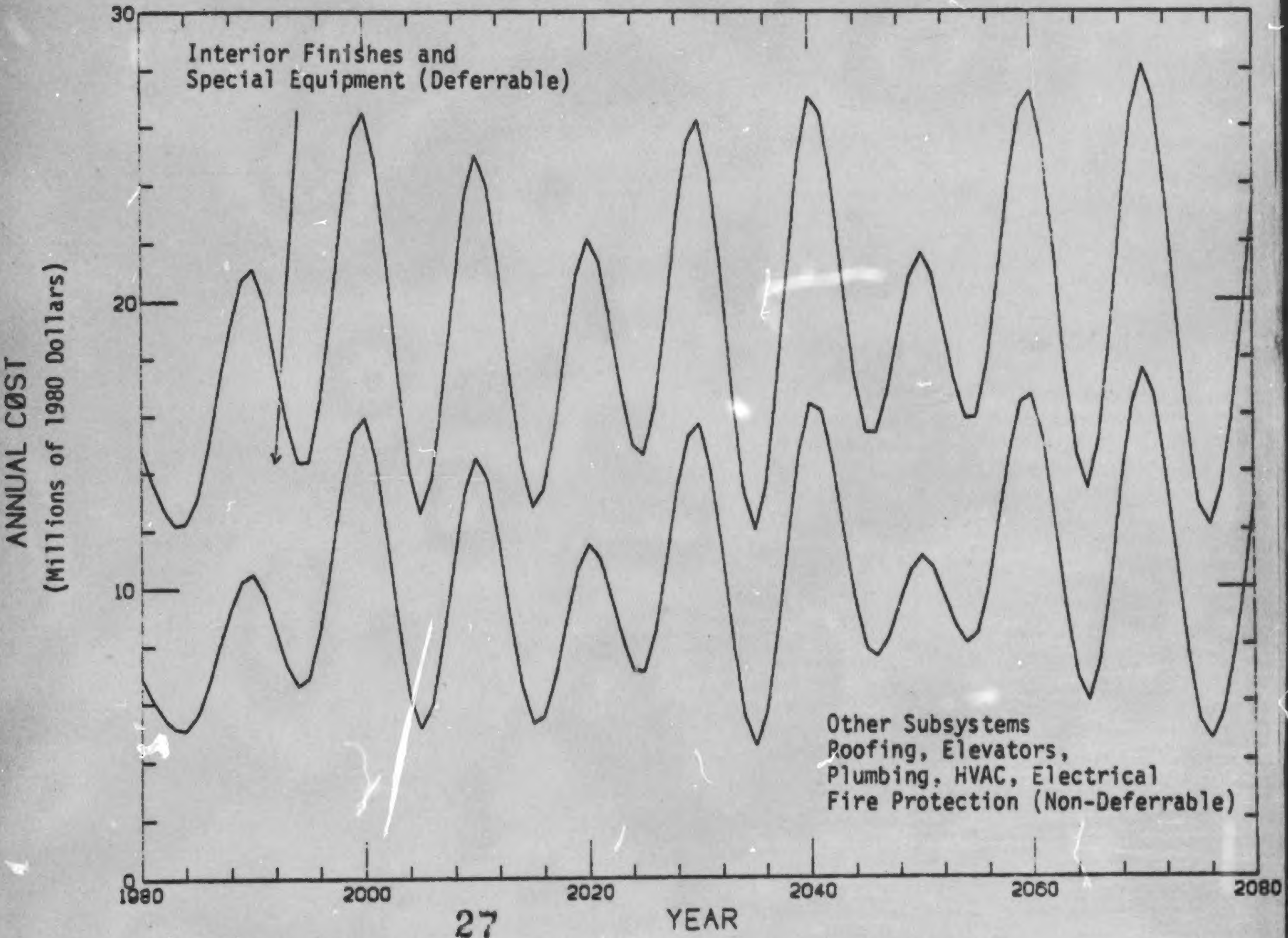
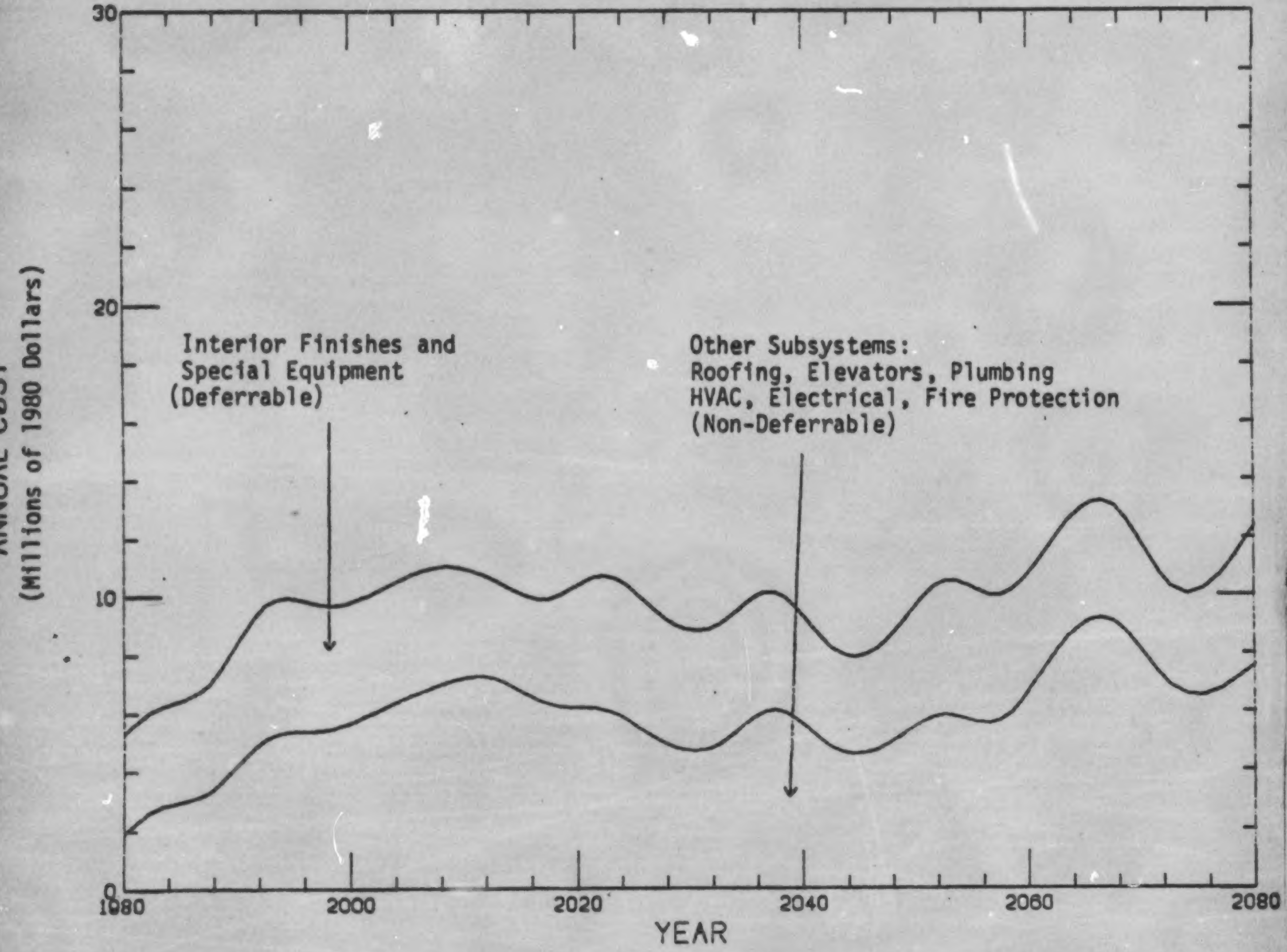


FIGURE 10

FACILITIES FORECAST LIKELY (SMOOTHED)



Using the Results

A mathematical model of this character provides the planning and budgeting administrator with an accurate and effective tool for evaluating the future renewal and replacement, or maintenance, requirements of the physical plant. It is a tool which simulates actual conditions at a specific location. It allows resource allocation to be based on a definable quantitative base. The flexibility of this model permits the future maintenance liability of new plant additions to be evaluated prior to commitment. This feature raises maintenance to a new level of consciousness in that it forces a realization of future liabilities and identifies the commitments necessary to support them. As a planning tool it provides the administration with a method by which to identify inordinately large funding requirements in outlying years and take the necessary action to meet those identified needs.

Stanford University has adopted this methodology as an integral part of the University's "Facilities Plan and Funding Forecast." University administrators believe that the established model affords a reasonable level of confidence in forecasting future renewal needs of the physical plant. Hence the decision has been made to move in the direction of a fully funded physical plant renewal program. This will be accomplished gradually over the next eight years.

While the established model will permit the administration to more effectively manage available resources, its single most important value lies in that it serves as the basis for a program by which renewal and replacement needs are identified in a creditable manner. A program of this type allows the establishment of a benchmark against which funding levels may be consistently evaluated.

While most universities have construction programs and space allocation programs, few have formally addressed the need for a plant renewal on a consistent basis. A program of this nature will fill the gap in providing the needed and necessary comprehensive facilities management plan.

Acknowledgements

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Academic Planning Adjustments in The California State University and Colleges: The Aftermath of Proposition 13

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Academic Planning Adjustments in
The California State University and Colleges:
The Aftermath of Proposition 13

During the worst of the post-Proposition 13 hour, when days were filled with committee meetings and evenings were filled with second thoughts about decisions just made, there were those who never failed to remind us of the possibility that some good could come from the process. It was small comfort at the time. As any who have lived through the reduction process can attest, the realization that the essence of the university stands to be altered by the decisions being made leaves one feeling immensely humbled. Most of us did not feel cheered, nor did we truly have confidence that through leanness greater strength would emerge.

It is time, after three years, to examine what may have been lost and gained. Most clear is the fact that three years are insufficient to measure many of the effects, which may be almost generational. But it is not too soon to advance three hypotheses. First, the budget reductions were damaging, and if their subtle effects on quality are not entirely or immediately discernable, we do know what was cut and what has not been restored. Secondly, in the area of academic planning, there were some process outcomes at both campus and system levels which are probably positive and surely leave us better equipped to handle rapid change and unforeseen budget contingencies. Third, a potentially positive substantive change is emerging in the form of a mission-based academic planning system. This could be the most promising outcome of all.

It is important to note that these hypotheses are advanced from the perspective of the central office, and from the perspective of the educational programs area at that. While much has been gleaned from discussion with campus personnel and from surveys of campuses, the system perspective can only be sympathetic to--but not fully representative of--the campus perspective. There emerge, within the crisis atmosphere, some concerns, questions, and doubts which are unique to the system level.

There is another difference in discussing system versus campus budgeting issues, and it is one of scale. For those not accustomed to these numbers, it may be helpful to preface the budget discussion by noting that for the 19 campus California State University and College System, a $14 million reduction is in reality less than 2% of a total budget which approaches $1 billion. There are around 35,000 individuals employed, over 17,000 of whom are faculty. Total enrollment stands at roughly 305,000 students. The enterprise is large.

An attempt has been made to draw some conclusions about the last three years. The views about what has been learned are solely those of the author, as they always must be in such speculative situations.

Review of Budget Reductions

It took only three weeks after the passage of Proposition 13 in June 1978 for the CSUC to find its budget reduced by $14.05 million. This figure does not include an additional reduction caused by the deletion of all salary increases. The $14.05 million was the State University's "share" of a $96.4 million statewide reduction. Budget language specified for all state agencies how the reduction was to be apportioned: roughly 56% in personal services and 44% in operating expenses and equipment. For The State University and College system, these reductions amounted to about 2% of the total budget which had been anticipated, exclusive of salary increases.

Because these were thought to be "one-time" emergency reductions, the operating expense and equipment reduction was accomplished by eliminating $5.6 million which had been budgeted for inflation. To effect the $6.7 million reduction in personal services, a number of areas scheduled for modest increases were held at past levels, but the bulk of the reduction was accomplished by increasing the "salary savings" requirement. This requirement rests on the assumption that at any given time salary savings will accrue from unfilled positions. The CSUC had long been required to return 2% of salary allocations to the State's General Fund, but raising the level obviously required that positions be left deliberately unfilled--an action more commonly known as a hiring freeze. Authority was given to each campus President to put into effect just such a freeze.

Hiring freezes and deferred maintenance, whether in the form of equipment maintenance or salary freezes, are emergency actions taken in response to one-time budget reductions. Within five months of the passage of the initiative, it became clear that more permanent kinds of reductions would have been wiser. The Department of Finance advised State agencies that the emergency reductions would be permanent; that is, the following year's budget would be calculated on a lower base. Moreover, on November 8, 1978, the Governor wrote to each State agency requesting it to identify "the five programs/activities of lowest priority . . ." in such a fashion as to achieve "a reduction of no less than 10% for State funded programs." Chancellor Glenn S. Dumke informed the Board of Trustees that

> there is no way of cutting $69 million without drastically cutting people--the high cost item in any higher education budget--and people represent programs. In our system, a cut of this magnitude would call for a 'bottom line' reduction of over 3,200 faculty and staff, with a resultant loss of capability that would force us to deny access to at least 31,000 students.[1]

The alternative to denying access, noted the Chancellor, would be to "increase workload to a level without precedent in senior institutions of higher education in the United States."[2] The list of dire alternatives, which included the closure of five small or two larger campuses, need not be repeated. It has since been reiterated in various states across the country.

The alternatives are draconian, and when a 10% reduction in State funding comes very close to being a 10% reduction in total budget revenues--as it does for the CSUC—the draconian alternatives are not exaggerated. A 10% cut--no less than a 15 or 20% one, as we were later asked to consider--leaves the University campus or system a different place.

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[1] Minutes, Meeting of the Board of Trustees of the California State University and Colleges, November 29, 1978. Page 1 of Exhibit A.

[2] Minutes, November 29, p. 6, Exhibit A.

Governor Brown responded that certain facts and realities had to be faced. These were 1) a drop in students; 2) inflation; 3) decline of the dollar; 4) Proposition 13; and 5) the impending "Gann Initiative" which would constitutionally limit the growth of state and local government to an amount equal to the increase in the cost of living (this alternative was indeed destined to be adopted by the voters).[3] While the Governor was reminded that his proposed 10% reduction was on top of funding losses attributable to enrollment decline, his only concession was an extension of the deadline for responding to the 10% reduction request.

By the following month when the Chancellor brought to the Board his proposals for responding to the Governor, it was apparent that fall enrollment had fallen far below the level budgeted for that year. Not only would funds have to be returned beyond cuts already made, but the base of the following year (1979-80) budget would again have to be lowered. The Chancellor said that for 1979-80, the Support Budget request had as a result of enrollment decline been reduced by over $12 million, reflecting a downturn of some 8,000 FTE students. As a result of this enrollment reduction,

> 357 faculty positions currently budgeted for 1978-79 have been deleted. An additional 264 support positions also have been lost. . . . Cumulatively, this means that in FY 1979-80, approximately 1,200 fewer positions will be available systemwide than were initially authorized in 1977-78. This figure . . . is made up of the 550-700 positions from the $14 million cut and the 621 positions from the enrollment decrease.[4]

The Trustees accepted the Chancellor's proposal that Project Teams be formed to address possible reductions in each of the following areas: Academic Programs, Capital Outlay Projects, Enrollment Projections, Support Programs, Administration, Calendering of Academic Programs (i.e., semester-quarter), Revision of Laws and Regulations, and Campus Closure.

Recommendations were to be brought to the Board within five months--in May of 1979. The Governor's Budget which came out in the interim, after adjusting downward for enrollment, carried forward the $14.05 million reduction and added a 1% ($6,919 million) reduction which was to be identified after the Project Teams had made their recommendations. In all, the Governor's Budget contained $20.9 million (or 3%) in unidentified reductions beyond those attributable to enrollment reduction.

As the Project Teams began their work, negotiations began with the Department of Finance about money which was due the State because of the 1978-79 enrollment shortfall. A deviation beyond 2% of the budgeted enrollment involves either paybacks to or reimbursement from the State, and the payback due under previous formulas was over $3 million. The Budget Act of 1978 contained a provision authorizing the Director of Finance to reallocate such funds to preclude lay-offs. The Chancellor's Office, after surveying the campuses, concluded that layoffs of permanent employees were imminent and requested that the entire amount be retained. After some negotiation, $1 million was retained and $2 million returned. This amount, however, was not added to the permanent base of the system budget.

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[3] Minutes, November 29, pp. 1 and 2 of Exhibit C.
[4] Minutes, p. 4 of Exhibit A.

By the time the Task Force reports were presented to the Board of Trustees in May of 1979, the sense of urgency had been lost. It was clear that the Legislature intended to restore some of the positions which the Governor's Budget had reduced; the State's fiscal picture looked better than anticipated; and the Trustees were in no mood to recommend or endorse reductions for the system. In terms of faculty positions, the CSUC emerged for the 1979-80 academic year with a loss, relative to 1978-79, of 424 faculty positions due to enrollment decline and 192.5 faculty positions due to unspecified reductions.

The Legislature subsequently provided a one-time appropriation of $2 million "to lessen the negative impact of enrollment declines and budget restrictions on the instructional programs and, to the maximum extent feasible, to lessen the negative impact on the upward mobility and affirmative action programs."[5] By fall of 1979, the Governor's Budget for 1980-81 proposed restoring faculty staffing to the level which prevailed prior to 1979-80. But a new ballot initiative caused some concern that the more generous Governor's Budget would never see the light of day. This time, the letter came from the Director of Finance. Arriving in January 1980, it requested that each state agency submit in less than a month an alternate budget which contained reductions of 30% in anticipation of a 25% reduction in State General Fund revenues which the initiative would involve. The Proposition, if passed, would take effect on July 1, 1980, and the Governor was preparing in less than two months to take to the Legislature a contingency budget. The deadline was met with a response from the Chancellor which indicated that a 30% reduction would involve the disenfranchisement of at least 100,000 students if State allocations were not replaced by tuition and 40,000 students even *with* a new tuition charge. This response was not accepted, but by the time a followup was prepared which detailed reasons that other alternatives had been rejected, the Governor had decided not to present a contingency budget.

Proposition 9 ("Jarvis II") did not pass; its budget impacts, if any, invovled only the political capital gained or lost during the months of intense discussion and negotiation among State agencies, the Governor, the Legislature, and the Department of Finance. Because the initiative was taken very seriously, the possibility of its adoption did set off a flurry of events within the State University and Colleges which are discussed later.

The budget story continues to be one of the impacts of Proposition 13 combined with enrollment uncertainties and an uncertain economic picture. The 1980-81 final budget came closer to the amount requested by the Board of Trustees than had any post-Proposition 13 budget. However, 1980-81 was the last fiscal year in which the State *still* had a surplus from which to draw in order to "bail out" local governments, and some data for 1981-82 will show the result for the California State University and Colleges.

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[5] Assembly Bill 1172 (Vasconcellos). Chapter 1176, Statutes of 1979.

Outcomes

Outcomes of the Budget Reductions

Anecdotal evidence was the first to be gathered in the aftermath of Proposition 13. Given the viselike effect of an enrollment decline and reduced support per student, had previously scheduled courses been dropped? Were students being turned away from courses they wanted? Were the tangible impacts of the salary freeze combined with the intangible effects on morale driving away some of the most able faculty?

At the end of the first post-Proposition 13 term, the combined estimate from the 19 campuses was that 18,000 students had been turned away from course sections, even though most campuses had not elected to use faculty positions to meet the mandated budget reduction requirement. An estimated 700 course sections were not offered, in part because the hiring freeze precluded shifting positions into areas where enrollment demand would otherwise have warranted adding sections. One campus surveyed its "no show" students and found that 15% of them had not enrolled because they were unable to get the courses they wanted. Some campuses reported that the reduction in supplies and services funding was necessitating curricular revision because laboratory requirements could not be maintained. Because there was considerable flexibility in the way each campus implemented the reductions, the remaining impacts were scattered among campuses, though the combined result is a long saga of reduced grounds maintenance, library hours, campus security, and the like. The loss of a salary increase was felt by many to put the faculty further behind what was already estimated to hvae been a 30% loss in purchasing power since 1969. One campus President did not attribute the faculty departures at his campus to Proposition 13 as such, but did suggest that the "psychological contract" had been broken as a result. Frank Bowen and Lyman Glenny, taking the "pulse" a year and a half after Proposition 13's passage, viewed both its past and potential impacts as one additional item in a long list of uncertainties, and cataloged the ways in which uncertainty itself "exacts a heavy toll."[6] One of these echoed the President's concern about the psychological contract. "In terms of a sense of security, it is probable that few administrators or faculty will see their institutions in the future in the same light that they did in the past. Salary freezes and funding uncertainties were severe blows to morale."[7]

Do any of these early assessments find support in data which subsequently became available? It is most difficult to say. Data are not collected on the most important questions of how student learning was affected or whether there were tangible effects on faculty and staff morale. Some indicators are presented here in a series of tables indexed to 1976-77, two years prior to the first combined impact of enrollment decline and Proposition 13. While the dip in appropriations and expenditures is obvious in Tables I and II, other measures are exceptionally inconclusive. One might have expected average student unit load to decline in the face of all the cancelled courses, but as Table III shows, it simply continued on a slow downward trend which had begun in 1973. The inability to offer sections was, as a result, probably not an explanation for the enrollment shortfall.

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[6] Frank Bowen and Lyman Glenny, Uncertainty in Public Higher Education: Responses to Stress at Ten California Colleges and Universities (Sacramento, Calif.: California Postsecondary Education Commission, 1980), p. 9.

[7] Bowen and Glenny, p. 7.

Table IV shows that the shortfall was not particularly anamolous in any event. Though workload policy had not changed, Table V shows that faculty workload did continue to drift upward, though the measures shown are influenced by changing balances between full and part-time faculty. The CSUC uses a staffing method which adjusts for changes in both level and mode of instruction, and this largely survived any arbitrary reduction. Because faculty position losses were due to enrollment decline rather than changes in workload expectations, the faculty allocation in relation to what we define as percent of "need" remained reasonably stable over the period.

Another trend continued, namely an increase in the participation rates of first time freshmen and a decline in the participation rates of Community College transfer students. Participation rates of 25-29 year old males continued their rather dramatic decline.

The budget indices are themselves influenced by such developments as the impacts of an early retirement program and retroactive salary increases. What then can be gleaned from these inconclusive numbers? First, by indexing back to 1967 in constant dollars, we find that there were years when we fared far worse in support per student than 1978-79, the Proposition 13 year. In 1971-72, the index fell to 81% of the 1967-68 level, while the Proposition 13 year on this index was 94%. The only possible explanation for the greater difficulty of absorbing the loss in 1978-79 is the lack of enrollment growth to mask the effects of falling behind the inflation rate. Falling behind had rarely involved losing positions in the past. Enrollment decline may have already been more destructive than the Proposition 13 reductions.

Secondly, if it is true that "psychological contracts" were broken, the effects will take more than three years to detect. Psychological contracts are not to be regarded lightly by universities already grappling with the effects of lagging salaries, which may in themselves discourage some of the most able from entering the faculty profession. We will never know who in the next generation was so dissuaded.

For the most part, budget losses occurred where decision-makers caused them to occur, and it is likely that the data now collected are not sufficiently well-tuned or deliberately designed to discern the subtle effects of reductions in faculty travel funds, for example. Many items not funded tended to be those which did not already have people in place. As a result, programs designed to meet new needs or cover increased costs were either not initiated or not allowed to grow. In the CSUC, as elsewhere, this meant that funding for student writing skills did not keep pace with the growing need for them. While the student affirmative action program fared relatively well throughout the period, new students so attracted are less likely than their predecessors to find all library services

Table I

State Appropriations per Full-Time Equivalent Student in Constant Dollars, Indexed to 1976-77

	1976-77	1977-78	1978-79	1979-80	1980-81
California State University and Colleges*	100	103	97	108	109
Comparison Institutions**	100	104	109	-	-

Table II

Expenditures per Full-Time Equivalent Student in Constant Dollars, Indexed to 1976-77

	1976-77	1977-78	1978-79	1979-80	1980-81
California State University and Colleges*	100	101	97	104	-
Comparison Institutions**	100	105	110	-	-

Table III

Student Workload: Average Units Attempted,* Fall Term, Indexed to 1976-77

1976-77	1977-78	1978-79	1979-80
100	99	98	99

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* Base data are shown in Attachment A.

** W. John Minter and Howard R. Bowen, *Preserving America's Investment in Human Capital: A Study of Public Higher Education, 1980* (Washington, D.C.: American Association of State Colleges and Universities, 1980), p. 62. (Based on financial reports of 26 comprehensive universities.)

Table IV

Faculty Workload Indexed to 1976-77

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
Total Weighted Teaching Units per Full-Time Equivalent Faculty	100	100	99	101	-	-
Lecture and Laboratory Sections per FTE Faculty	100	103	103	105	-	-

Table V

Reported Full-Time Equivalent Students Compared to Budgeted Full-Time Equivalent Students

1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
-3.3%	-0.1%	-3.3%	+1.6%	-	-

Table VI

Budget Request History: Percent of CSUC Trustees' General Fund Budget Requests Funded in Final Appropriations (Includes Salary and Fringe Benefits)

1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
98%	94%	89%	96%	96%	87%

available at convenient hours or as many classes to choose from. There is a cost to not starting needed programs. The real problems, of course, are not those of measurement but rather those of planning and policy--the story of financial exigency anywhere.

Process Outcomes: The Project Team on Academic Programs and the Committee on Academic Planning and Program Review

Shortly after the passage of Proposition 13, when the Governor had requested identification of areas for possible budget reduction, academic programs were selected for investigation. A broadly representative Task Force on Academic Programs was given four months to conduct

> a review of existing academic programs on a regional basis in order to identify and reduce multiple and undersized programs . . . this special review of academic programs should result in the development of: (1) plans for consolidating existing degree programs on a regional basis to an even greater extent than at present; (2) guidelines for continued program review and development; (3) criteria for program balance by campus and system; and (4) proposals for program planning in the 1980's.[8]

Initially, the Project Team vigorously pursued this charge. It approved the Chancellor's staff recommendation to impose a moratorium on new degree programs, options, credentials, and net increases in the number of courses. Lists of low enrollment programs were rapidly prepared, and regional meetings with campus representatives were scheduled and held so that these lists could be reviewed. If in the process the campuses redesignated these lists as "hit lists" rather than review lists, and if the fear of layoff was needlessly exacerbated, it remains the case that the Project Team from the outset believed that these were the actions required to protect academic program integrity if major faculty reductions occurred. Indeed, the instincts were right in suggesting that if program integrity and institutional integrity are the priorities, then reduction schemes should focus on academic programs rather than on non-programmatically defined groups of students or faculty. But the complexity of the problem meant that it could not really be grasped in the first month of committee work. Fortunately, as the Committee began to understand the complicated scenarios, it recognized that what was needed was not a list of programs to be cut, but rather some new planning mechanisms at both campus and system levels. In a fortuitous move, the Project Team decided to reject its old charge and write itself a new one.

This came about in part because the revised enrollment projections indicated that the loss of budget positions due to enrollment decline was potentially far greater than the potential loss due to Proposition 13. Moreover, the loss due to enrollment change would be spread over many years, and would require adjustments of a very different kind than would a one-time reduction.

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[8] Minutes of the Meeting of the Board of Trustees, December 28, 1978.

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> The Project Team therefore considered its primary charge in the context of programmatic adjustments necessitated by losses of faculty positions which have already occurred or are imminent. . . . the Academic Program Project Team believes that the current problem is not to find a way of reducing instructional budgets but rather to recommend a structure for accommodation to budget limitations in order to maintain or enhance the quality of instructional programs. [9]

Once the problem and the charge had become clear, the Project Team set itself within the few months available to the task of devising a new planning and program review procedure which would permit campuses to maintain program quality in the face of possible long term, recurring, enrollment declines.

Stephen Weiner and Donald Speich, in their study of Proposition 13, relate all that the Legislature accomplished within three weeks of the initiative's passage, a time in which nonpartisanship prevailed. "To many veteran lawmakers, the three-week 'bail out' session was the Legislature's finest hour. Nearly a year later, those interviewed would recall it fondly."[10] Many members of the Project Team on Academic Programs have similar kinds of recollections of purposeful, diligent hours and, given the time constraints, a remarkable product. The Project Team commissioned two ad hoc committees. One, consisting of Presidents, Academic Vice Presidents, and Faculty Senate representatives of the six smallest campuses, was asked to define an essential core of academic programs which might be used for all campuses in The CSUC. It was reasoned that programs not offered at the smaller (but increasingly mature) campuses did not belong in a system core list, but that larger campuses already offered this core and more. This ad hoc committee, which wisely rechristened itself the "Developing Campus" committee, proposed just such a list, based on a review of programs already offered and on a list which had been adopted in 1963 by the Board of Trustees. The Project Team took that list and recommended that in these basic subjects, need and demand should not be the preeminent criteria for offering degrees. Rather, qualitative criteria regarding program integrity were to be paramount.

A second ad hoc committee of graduate deans was asked to suggest minimum systemwide quality standards for the review of existing and proposed graduate degree programs. These too were incorporated into a recommendation that guidelines be disseminated for system review, comment, and adoption. The statewide Academic Senate ultimately took on this charge.

The Project Team further recommended that access be defined in terms of programs, and suggested the kinds of programs to which students could expect the greatest access and which kinds would be more limited within the State. System policy since 1971 had required the systematic review of each academic program, and the Project Team recommended that greater effort be made to link program review to resource allocation processes. It turned responsibility over to the campuses for the identification of programs to be discontinued, and required that each campus develop discontinuation procedures. Regional consolidation of programs, if considered in the future, was to have as its guiding principle institutional integrity and maintenance of the best programs.

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[9] The California State University and Colleges, Report of the Project Team on Academic Programs (Long Beach, Calif.: Office of the Chancellor, May 1979), pp. 15-17.

[10] Don F. Speich and Stephen S. Weiner, In the Eye of the Storm: Proposition 13 and Public Education in California (Washington, D.C.: The George Washington University, 1980), p. 32.

There were two recommendations on which this study will focus as having potentially the greatest impact. The first was substantive:

> Each campus which has not already done so should develop a statement of missions and goals which can be used locally to guide program planning, review, and resource allocation processes and can be used on a systemwide basis to guide recommendations on program distribution, implementation, and discontinuation.

Procedurally, the Project Team recommended how all of this was to be accomplished. It asked that the Chancellor "establish a Standing Committee on Academic Planning, with representation of faculty, students and administration." The Chancellor accepted all of the recommendations.

Bowen and Glenny had suggested that one of the benefits of Proposition 13 had been the early warning of the need to prepare and adjust to change.[11] There is no question that the Committee on Academic Planning and Program Review was itself a direct result of Proposition 13 activities, and its adoption of a mission-based planning model occurred far sooner than would have been the case had the alarms not been sounded.

Substantive changes in the academic planning process at campus and system levels stand to be perhaps the most positive outcome of the "crisis" period. But a few of the procedural changes are first worth noting.

At the system level, meetings of the Presidents, Academic Vice Presidents, and Deans of Graduate Studies are regularly scheduled. The Academic Senate of the CSUC serves at the system level in a role not unlike Faculty Senates at the campuses, and has always taken a significant role in system educational policy. But an "omnibus" standing committee had not previously been utilized in academic planning, and the proposal was initially regarded with skepticism on the campuses and in the Academic Senate. After two years of experience with this committee, I can offer an opinion only from the perspective of systemwide administration, but it is a highly positive one. In a very low key way, this Committee serves a role filled by no other.

In part, this is because the Committee can serve on an "as needed" basis when issues arise. Just before the Committee's first meeting, for example, the $2 million emergency faculty allocation was announced and decisions were needed quickly on how allocations were to be made to campuses. Legislative language required that the money be used to lessen "the negative impact of enrollment declines" and "the negative impact on the upward mobility and affirmative action programs." The Committee was instrumental in suggesting a viable allocation scheme.

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[11] Bowen and Glenny, p. 20.

Later, when Proposition 9 contingency plans were being developed, the Committee was instrumental in proposing guidelines which each campus could use should major reductions become necessary. The principles developed by the Committee made their way through other consultative groups reasonably intact as the primary principles to which each CSUC campus would be expected to adhere in the event of major budget reduction. These were undergirded by the fundamental guidelines that "curricular priorities are paramount" and that long term institutional integrity was to be maintained. Accordingly, the system guidelines for the maintenance of quality for campus use in planning Proposition 9 reductions were:

--Maintenance of the current student-faculty ratio, except where change is occasioned by change in program mix;

--Maintenance of the current faculty workload standard;

--Individual consideration of each program and department; i.e., no across-the-board percentage reductions of all departments or non-programmatic reductions of faculty classes;

--Protection of the integrity of those programs which will remain; preservation of accreditation where applicable;

--Retention of lower division and of a general education program;

--Retention of a "core program" in recognition of the system's role in serving a non-mobile student population.

Fortunately, the guidelines never had to be disseminated to the campuses. But there is little question that future years will bring new budget problems requiring rapid responses. The CSUC, by virtue of this committee, is better prepared to respond rapidly to unknown contingencies.

Substantive Outcomes: A Mission Based Planning System

The Committee on Academic Planning and Program Review did not conceive of or invent a planning model which attempted to link budget, program review, and program planning decisions to each other through detailed mission statements. Models had long appeared in the literature, and in one respect, what The California State University and Colleges has embarked on may be just one more try. But potentially, there are two differences. One is a more visible need now for such systems. Secondly, the current proposal has potential rewards for individual campuses which may outweigh the potential drawbacks.

The California State University and Colleges has long had an academic planning process wherein staff in the segmental office review and comment on campus five year curricular plans before recommending their approval to the Board of Trustees. Programs which had been so approved on an academic plan are then submitted in full proposal form to the Chancellor's Office shortly before the scheduled date of implementation, where they are subject to review and approval.

A new committee composed of students, campus administrators and faculty--with faculty being in the majority--is inevitably going to be concerned that campus and faculty interests be adequately protected in this system-level review process. Moreover, the Committee was soon to find that Proposition 13 had not discouraged most campuses from proposing new programs, and there were recommendations to be made rapidly in some cases about how many Accounting degree programs, for example, the State needed; where they should logically be located; and what criteria should govern their placement. The Committee also confronted the vexing problem known to many administrators: given serious concerns about resource uncertainties but also sensitive to possible institutional inertia and overcaution, what is the appropriate balance of encouragement and discouragement?

From one perspective, it was natural that the committee should arrive at unique campus mission as a guiding principle in the system review and allocation of academic programs. Campus uniqueness was already beginning to be stressed more at the campus level. When competition increases, whether for students, for funds, or for both, "differentiation" is an instinctive response. It is also a sound principle of both economics and marketing. The appearance of uniqueness is sufficient to gain competitive advantage, though it is probably insufficient for resource allocation and program approval decisions.

The similarity of mission statements in comprehensive colleges across the country has been often noted. When the Committee examined the existing mission statements of the 19 CSUC campuses, it found, not surprisingly, that they would in their current form serve little purpose in program or budgeting decisions at campus or system levels. While each campus has a unique profile of student origin, student age, course offerings and the like, each is in fact a comprehensive liberal arts institution--just as the system mission says it should be. Moreover, mission statements have a tradition of being public relations kinds of descriptions reduced to whatever denominator is required to satisfy everyone on the campus. Because it was aware that even such bland appearing consensus had been tedious to bring about, the Committee almost knew better than to ask for more useful, operational, distinctive mission statements. Campus faculty and administrators were still occupied with budget contingency planning and retrenchment policy. But two considerations probably tipped the scale. The Committee had already suggested that if reductions became necessary, campuses not resort to across-the-board cuts, but use programmatic criteria instead. Could less be asked of system allocation methods to campuses? Moreover, if sufficient differentiation could be elicited, the appeal of using unique mission statements for some system level program and resource allocation decisions was great.

Each campus was asked to submit with its already scheduled five year curricular plan a "statement about the overall plans of the campus" and a "statement of campus planning premises." Previously developed statements were acceptable, but the Committee reiterated its intent to work eventually toward operational statements of missions and objectives which could be used to guide program recommendations at both system and campus levels.

> A reasonable approach would appear to be the development of more precise understandings among the Trustees, the Chancellor's Office, and the campuses concerning both similarities among the campuses as well as unique aspects of each campus. Understandings of unique aspects should include both those which now exist and those which the campus proposes to be areas of special strength or excellence.[124]

Each campus was also asked to specify the premises underlying its academic plan. Assumptions about enrollment; resources; changing student populations; expected balance between undergraduate and graduate instruction; and the environment were elicited. A full and comprehensive response was not requested or expected in the first year, but was a long term goal.

Just as initial campus reactions to the request had run the gamut, so did the responses. The open-ended request had, as expected, yielded non-comparable responses which did in any event comprise an interesting package. One Committee member observed that at last the Committee had come up with a tangible product--a book! Two campuses had just completed detailed and operational mission statements and they were the only ones to incorporate common planning assumptions (demographic changes and financial uncertainties) into their mission statements. These are two campuses which have a strong and broad commitment to mission-based planning, and intend (without prodding from the Chancellor's Office) to use their mission statements to guide program priority decisions.

Differentiation did emerge in the planning assumptions. These reflected already existing differences which were often functions both of location and history. The commitments of urban, commuter institutions to both the students and the life of the community vary from the commitments of more residential institutions which attract non-local students.

It was not surprising that campus enrollment assumptions were more optimistic than system projections. There is wisdom in optimism, and as long as contingency plans are being readied, well-informed optimism is probably positive. Contingency priority plans were being readied in many cases; five campuses provided them. In these, priorities indeed drew on mission statements. Some became "inoperative" when Proposition 9 failed, but they surely demonstrated that when needed, such planning could occur. These contingency program reduction plans bore little visible relation to the new program plans of the same campuses. It may be that priorities for program development are genuinely different than priorities for program reduction, or it may be that more "fine-tuning" is needed.

Discrepancies between the curricular plans and the planning assumptions were found in several cases. This is not unexpected when new program plans have long been in place and mission statements and planning assumptions are belatedly grafted onto them. These discrepancies did provide some new criteria for reviewing curricular plans, but some campus administrators were already well aware that a curricular plan which proposes eight new master's degrees is inconsistent with a planning assumption speculating that demand

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[12] Alex C. Sherriffs, Vice Chancellor, Academic Affairs to Presidents, California State University and Colleges, January 15, 1980.

for graduate programs will decline and a mission statement which is silent on the priority accorded to graduate programs. Fine tuning takes time.

Such incidents did, however, serve to point up an area in which great sensitivity and caution should be exercised. Close linkage of mission, budgeting, and program review marks a change in a system which has served higher education remarkably well. New programs have come about because of individual faculty initiative, and before reaching the system level, they have often survived campus review processes because of the recognized qualitative strengths of departments and faculty. One tampers only very carefully with such success. It was in part this recognition that led to a second year of inviting but not mandating more operational mission statements. In addition to updating the initial request, an invitation was issued in the second year:

> Each CSUC campus may consider identifying existing or planned areas of curricular excellence which it wishes to target for special development or recognition and for which it wishes to be specifically recognized within the CSUC system.[13]

The second year responses are encouraging to those who believe that there is merit to mission-based planning. The level of activity has increased. A number of CSUC campus administrators have expressed an interest in what sister institutions are doing, and the "book" has just been released to all of the CSUC campuses. It contains nearly all of the mission statements, new and old, and selected samples of planning assumptions and priority studies. Several campus administrators have expressed an interest in designating areas of excellence, and there is some interest in the Chancellor's Office in seeing if these are usable for any resource allocation purposes. I suspect that some campus administrators are waiting to see if there is any benefit in having "areas of excellence" before suggesting to the majority of faculty that their areas do _not_ fall within the special area of excellence, and it is incumbent on system administration to insure that there _are_ benefits.

I hope that we do not labor under any illusions about the importance of these developments. Most within the system go about their business without knowing anything about these changes. There is no evidence that any program was proposed or ruled out at any campus because it did or did not conform to the newer, more specific mission statement. It is beginning to appear that mission statements will continue to be written so that no program which might be desired could be ruled out. As long as the mission statements inform priority listings when priority listings become necessary, the intended purposes may be served.

A commitment has been made over the next three years to take more detailed, integrated mission statements, planning assumptions and curriculum plans for each campus to the Board of Trustees. After that, it will be time to ask honestly if the investment of time--particularly at the campus level--has yielded results which make continuation of this planning method worthwhile.

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[13] Alex C. Sherriffs to CSUC Presidents, April 3, 1981.

Conclusions: What Has Been Learned?

1. There is a human and an institutional need for certainty and continuity which should not be forgotten in a crisis atmosphere.

   The recently issued planning statement of the University of California does not stand alone among university planning documents across the country in noting that "change is the principal certainty in a largely uncertain environment."

   But in retrospect, it was not the prodding to develop new procedures to cope with change where the central office or systemwide committees had the greatest impact during the period. Rather, the few assurances of continuity seem to have been most important and certainly most welcomed. When time is limited, it may appear wasteful to devote the countless hours required to reach agreement on the list of "basic programs." Yet this list was picked up by many campuses in their own planning efforts and documents. It reaffirmed that the "core" had not changed and that there remained a system-level commitment to the liberal arts mission. The Chancellor's public commitment to keeping all campuses open had a similar salutary effect. Campus planning assumptions relied on the 1960 California Master Plan for Higher Education in a positive way, and there seems almost to be a renewed, widespread dedication to and appreciation of the system's role within California public higher education.

   What some would praise as continuity others would condemn as inertia. But if change will be as stressful as some suggest, it may be wise to place more emphasis on identifying those areas where continuity can be soundly embraced.

2. Communication gaps widen and the distance between the system office and the campuses may cause misjudgments and misunderstandings.

   Most reports, planning assumptions, and curricular plans received in the Chancellor's Office from the campuses showed little evidence of serious concern about fiscal exigency or enrollment decline. As already noted, there was a major gap between campus and Chancellor's Office enrollment expectations, and in many cases there was a gap in assumptions about resource support. While hearing about the destruction of morale and the danger of inertia, the Chancellor's Office was receiving proposals for new programs in what seemed like record numbers. The tendency was to believe the written evidence more than the anecdotes. The evidence suggested that there were too many at the campuses who did not appreciate the seriousness of the situation. The Chancellor's Office assumed for itself the role of purveyor of hopeless forecasts.

   Not everything turned out as dismally as some in the Chancellor's Office had forecast. Proposition 9 was rejected by the voters, the Governor did not reduce any budget by 10, 15 or 30 percent, and there were several last-minute rescues. Moreover, it appears in retrospect that there was more realism at the campuses than initial evidence had revealed. But in the process of "preparing," we had strongly encouraged some campuses to develop program priorities for contingencies which did not occur. Now, there are faculty who know that their subject areas would have been--and still could be--the first to be discontinued. We worry about the effects on program quality when resource problems require that faculty teach in secondary and tertiary fields. Perhaps we should worry equally about whether those who really were victims of broken psychological contracts--who were told that they were at the bottom of the priorities--still manage to bring to their profession the enthusiasm which makes them effective as faculty and particularly as teachers.

In case it does not go without saying, the destructiveness of campus closure rumors and other assorted layoff rumors was recognized then and now. Too many "hit lists" were rumored, and too many targets selected. When decisiveness is possible, it is desirable.

3. There are no easy answers for reducing expenditures in an emergency situation, but each new committee will begin by hoping to find them and conclude by confronting mission questions.

All of the real and false alarms spawned uncountable campus and system committees, each of which examined numerous proposals for reducing the budget. Many scenarios involved reducing the number of employees needed by changing the student faculty ratio or reducing the number of students through pricing or admission policy change. But such schemes strike totally indiscriminately at academic program enrollments and consequently faculty positions. Hold down the FTE by limiting the number of units a student can take? Public Administration, which serves mainly part-time students, is untouched, but Music may be devastated. When such policy is systemwide, the impact is multiplied; the same subject is devastated at 19 campuses. Raise foreign student tuition or cease admitting undeclared post-baccalaureate students? Again, each major has a unique mix of full-time, native, resident or commuting students. Majors tend to be differentiated by such personal characteristics as socio-economic status. The effects of eliminating any group of students will not be evenly distributed among programs or faculty. Most campuses are in any case not prepared to link the effects of discontinuing undeclared students to any particular faculty positions.

Generalized categories of faculty such as part-time faculty are of course also unrelated to academic programs or to categories of students. Inevitably, a decision must be made about the organizing principle around which reductions will be made--and then mission enters the discussion. The program-student-faculty principle occurs at both campus and system levels. The discussion of campus closure raises system-level mission questions. Are there relative priorities between access and maintenance of quality?

We are, nevertheless, ahead. Each new committee is able to build on the insights and recommendations of the last; insights come more quickly and response is more rapid.

4. The processes have brought into focus the mission questions which this and other State University systems will have to confront in the 1980s if mission-based planning is to succeed.

David Breneman has suggested that "a priority need on these [State University] campuses will be to establish clear and distinctive identities and missions." He urges that curricular change be linked visibly to staffing patterns so that educational policy decisions "can be addressed honestly and on their merits, rather than having educational policy determined ostensibly on educational grounds, but in reality, for reasons of job protection."[14]

The survival mission is rarely stated but surely understood, and most have expressed concerns about potential conflicts between survival and curricular quality. There may be developing a third presure on the organizing principle of comprehensive state universities and colleges, and that is access. The mission statements and particularly the planning assumptions of many CSUC campuses appear to be drifting far more to access as an organizing principle than they had in the recent past. In pragmatic terms, this means that mission may not be defined so much by curriculum as by who is served. In turn, the curriculum is prescribed not by a conception of what every comprehensive college should offer, but rather by what programs are needed to serve local and regional populations who are limited by geography to a particular institution. Without attaching a value to this development, I do see it as creating a tension on the campuses and at the system level for some years to come. Survival is never likely to become an explicit mission, but it will underlie decisions which may be made about the relative emphasis on access versus curricular tradition and may indeed become the decisive factor in determining the balance.

The success of mission based planning, not to mention the integrity of institutions, will ultimately depend on the willingness of campus leaders in particular to tackle these difficult mission questions and persevere until they are answered. The task should not be underestimated.

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[14] David Breneman, "Economic Trends: What Do They Imply for Higher Education?" AAHE Bulletin, September 1979.

ATTACHMENT A

Base Data
The California State University and Colleges

I. Budgeted and Reported Full-Time Equivalent Students

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
Budgeted	239,000	235,980	236,670	228,900	230,330	236,470
Reported	231,251	233,699	228,939	232,552	238,495	-

II. General Fund State Support for the Fiscal Year Exclusive of Student Fees, Non-Resident Tuition, Federal Contributions and Miscellaneous Reimbursed Activities, and Capital Outlay (in thousands)

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
Trustees' Budget	626,167	719,207	774,678	852,451	952,756	1,117,897
Final Budget Total Available	614,105	673,316	691,934	821,474	923,526	973,852
Total Expenditures	604,833	666,072	682,983	816,158	-	-

III. State Appropriation per Student (FTEs in Current and Constant Dollars)

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
Current Dollars	2,569	2,853	2,924	3,589	4,009	4,118
Deflator	100.00	107.99	117.28	128.90	144.37	161.69
Constant Dollars	2,569	2,642	2,493	2,784	2,777	2,547

IV. Average Term Units Attempted by Undergraduate Students, Fall Term

1976	1977	1978	1979
12.49	12.38	12.32	12.34

Data Sources: Statistical Abstract of The California State University and Colleges, Support Budget of The California State University and Colleges, Survey of Current Business (Price deflation of State and Local Government Purchases to 1979-80; estimated at 12% thereafter)

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Faculty Early Retirement:
A Planning and Budgeting Issue in Higher Education

by:

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Faculty Early Retirement:
A Planning and Budgeting Issue in Higher Education

Introduction

In the 1960's higher education was called upon to respond to expanding student enrollments; in the 1980's enrollments are expected to remain constant or decline. During the next decade of steady state, expansion of a program typically will take place only if another program contracts. In addition, shifts in enrollment patterns among programs will result in some areas of instruction having too many faculty and others having too few, a situation that calls for greater flexibility in staffing.

Compounding these conditions is the recent age 70 retirement legislation enacted by Congress. The central provision in the 1978 Amendments to the Age Discrimination in Employment Act (ADEA) raises mandatory retirement age to 70. This change does not become effective for employees with unlimited tenure until July 1, 1982, under the federal law. In Oregon, however, the 1979 Legislature extended retirement age to 70 for all employees under the Public Employees Retirement System effective July 26, 1979, including faculty of the Oregon State System of Higher Education.

Interest in voluntary early retirement plans for higher education faculty stems from steady state conditions and prospects of an aging academic workforce. Early retirement programs are potentially useful tools to encourage turnover and revitalize faculty ranks, providing flexibility in program staffing and opening opportunities for young academics, including women and minorities. In addition, early retirement may be used as a fiscal policy to reduce payroll costs. Options also may provide the increased benefits to enable individual faculty who wish to retire early to do so.

Against this background, the purpose of this study is to provide some insights and planning tools for institutions and systems seeking solutions to a potential "staffing crisis" by changing personnel retirement policies. One such policy change may be the implementation of one or more voluntary early retirement programs for faculty.

The two most distinctive features of this study are that early retirement plans for a system of different types of institutions are considered and that the complete scope is covered--from surveying faculty, to developing predicted rates of retirement, conducting computer simulations of consequences, developing cost analyses, and discussing implications for planning and budgeting in higher education.

The study addresses the following questions:

1. What factors are influential in or related to faculty members' intentions to retire early?
2. How much faculty interest is there in specific early retirement options?

3. What rates of early retirement might be predicted under specific early retirement plans?

4. What impact would early retirements have on faculty turnover rates at specific institutions?

5. What would specific early retirement plans cost and what would be the potential benefits?

6. What are the implications of early retirement for planning and budgeting in higher education?

Literature Review. An extensive search of the literature was made through the ERIC computer system. While early retirement may be a much talked about topic in higher education, there is little solid empirical published work on early retirement for academics. Carl V. Patton's *Academia in Transition* (1979) is the only full-length, hard cover book identified. Several excellent surveys and issues reports have been published by TIAA-CREF and American Council on Education, as examples. Numerous articles have appeared in recent years, many of them in *Academe*, the American Association of University Professors newsletter. The empirical studies, however, are primarily in unpublished institutional reports, which were obtained from institutions directly and from available files in Oregon.

Importance of the Study. As an AAUP report of the Special Committee on Age Discrimination and Retirement (*AAUP Bulletin*, Sept. 1978, p. 187) notes:

> In fact, relatively little attention has been given to enlarging our understanding of the labor force participation rates of people approaching retirement or their responses to changes in retirement provisions and to incentive plans that might alter retirement rates. Likewise, relatively little attention has been given to developing a better understanding of how institutions can operate to affect the age structure of their faculties, to change the pattern of compensation by age, and to alter the incentives for inducing earlier retirement. None of this work to our knowledge has analyzed behavior in a framework that would lend itself to projection.

Concerned about the age 70 ADEA amendment, the report urged: "Deliverance lies in finding even less expensive methods of encouraging early retirement; such a study deserves immediate attention."

Methods

Questions designed for this study were included in a written questionnaire administered in April 1980 to all faculty age 45 and above in seven institutions of the Oregon State System of Higher Education. The institutions include three universities and four colleges (one a technical institute) governed by the State Board of Higher Education in Oregon. Personnel policies are made on a system-wide basis by this board and administered by the Board's Chancellor and the President of each institution.

The research was conducted under the Early Retirement Project of the University of Oregon Institute for Social Science Research and funded by the Northwest Area Foundation.

Questions developed for this study were intended to solicit the following:

- Ideal or preferred age of retirement.
- Reasons for that ideal age.
- The three most important conditions that would allow respondents to retire at the ideal age.
- Realistic or expected age of retirement.
- Reasons for that realistic age.
- Retirement age each respondent might expect under each of three early retirement options described.
- The preferred plan of the three options.

Demographic data and several other variables also were of particular interest, including: age of respondent, sex, rank, type of institution, subject area, years worked in the State System, feelings toward retirement, and adequacy of financial planning for retirement.

The three early retirement options developed for this study and described in the questionnaire are as follows:

PLAN A: Part-time employment following early retirement, with continued medical and life insurance coverage. Part-time pay would be up to 25 percent of salary at retirement or $6,000, whichever is less. This option may be elected no earlier than age 60. The individual is not obligated to work until age 70. Regardless of the age at which the person chooses to quit working, the medical and life insurance coverage continues until Medicare eligibility begins.

PLAN B: A 6 percent income supplement for those faculty who announce by age 60 that they will retire by or before age 65. This annual salary addition would be paid into a tax-sheltered annuity. For example, a person with a $25,000 salary would accumulate an annuity over a five-year employment period (age 60-65) that would pay, due to interest earned, approximately $125 a month for 10 years (age 65 to 75).

PLAN C: Upon early retirement at age 60 (or later) receipt of full pension benefits based on years of service computed as if you had worked to the mandatory retirement age under the Oregon Public Employees Retirement System (PERS).

These three plans were used because they are currently either under review or in existence in the Oregon State System of Higher Education. A version of Plan A, part-time employment, has been used at Portland State University and is being considered at the University of Oregon. A proposal similar to Plan B, the income supplement, has been developed at the University of Oregon and is awaiting review by the Chancellor's Office. Plan C is provided under current Oregon law and has been available since 1973. Features of the three plans are similar to several of the ten early retirement options described by Patton (1979).

Data Analysis. Cross tabulations were used to analyze retirement age responses with demographic factors as well as responses on feelings toward retirement and financial plans. As pertinent, chi square statistics are given to demonstrate a systematic relationship between two variables. In addition, results of tests for the difference between means are presented. These involve pairing each respondent's answers on retirement ages. Also, differences between means of two groups were developed--for age of respondent, sex, rank, and type of institution. In all cases, statistical significance is at the .01 level, one-tailed, requiring a t-value larger than 2.326.

Based on retirement age responses from survey data, probabilities for retirement ages under the three plans and ideal age were used as variables for faculty flow modeling and compared to current retirement estimates. One university and one college were selected for this computer simulation projecting for a 20-year period. Differences among plans and between institutions were analyzed and implications discussed. Cost analyses then were developed based on retirements expected from the computer simulation.

Finally, personal interviews with selected faculty and administrators and collection of information on Ph.D. production and state laws were used in discussion of implications in terms of legal, administrative, political, and market feasibility.

Results

Of the 1,222 questionnaires distributed to Oregon State System of Higher Education faculty, 647 were returned for a 53 percent response rate. This response was surprising considering the length of the questionnaire and short time for return. Clearly, the survey struck a responsive chord.

The size and distribution of the responses insure representativeness of the population, including by type of institution and subject area taught.

In terms of the questions posed, the following results were obtained:

1. What factors are influential in or related to faculty members' intentions to retire early?

   Conditions. Survey responses indicate that the three most important conditions that would allow faculty to retire at their ideal age are 1) additional pay; 2) insurance; and 3) part-time employment. Patton (1976) and Ladd-Lipset (1977) both found larger retirement benefits were the primary condition affecting earlier retirement, with part-time employment second.

Age. Younger faculty (under 55) indicate earlier ideal retirement ages than faculty 55 and over. Difference of means tests between the two age groups is significant (t=3.11). This is consistent with the Ladd-Lipset finding of substantial increases in proportions of faculty planning to stay on until their late 60's or 70's once imminence becomes a factor.

Sex. Women realistically expect to retire earlier than men (63.6 to 64.3). This is consistent with Patton's finding of 64.5 for women to 65.6 for men. More significant, in the statistical sense, is the difference between women's mean ideal age (59.5) and men's ideal age (61.2) in the present study.

Rank. As with Patton's finding, full professors in the OSSHE survey ideally plan to retire later than faculty of lower ranks.

Institution. College faculty indicate lower ideal retirement ages han university faculty in the Oregon State System.

Subject Area. Business, health/P.E. and education faculty are most favorable to lower ideal retirement ages, while science, humanities and social science faculty prefer later retirement.

Attitude. Those respondents with the most positive feelings toward retirement indicate earlier ideal retirement ages than those with negative feelings. Similarly, Patton found that those who plan to retire early tend to look forward to retirement.

Satisfaction and Performance. Dissatisfied faculty tend to desire early retirement. The best researchers wish to retire at later ages. This is consistent with Ladd-Lipset's finding that faculty with the highest scholarship standing and performance want late retirement, while those with the fewest scholarly attainments are most interested in retiring early.

2. How much faculty interest is there in specific early retirement options?

Survey responses show that respondents' mean realistic age of retirement is 64.24 compared to mean ideal age of 61.01.

Under the three early retirement options described in the questionnaire, respondents' mean retirement ages include:

Plan A (part-time employment)	62.5
Plan B (income supplement annuity)	63.6
Plan C (Public Employees Retirement System)	62.0

In terms of most frequently preferred plan:

Plan A	28%
Plan B	11%
Plan C	43%

In the present study OSSHE faculty exhibit an increased interest in early retirement compared to OSSHE faculty surveyed in 1973. More than 36 percent realistically expect to retire before 65, in contrast to 15 percent in the earlier survey (Oregon Legislative House Research Office, 1973). More than 63 percent in the present study give their ideal retirement age as below 65, with nearly half of those below 60.

The present study shows stronger interest in early retirement by Oregon faculty than the University of Southern California faculty (Peterson and Morey, 1976). For USC faculty, only 12 percent gave the expected or realistic age as before 65, and 36 percent listed under 65 as a preferred or ideal age.

3. What rates of early retirement might be predicted under specific early retirement plans?

From survey data, probabilities for the three plans and ideal age were developed for two institutions as variables from current probabilities in the computer model at the following key ages.

	U. of Oregon				Ore. Coll. of Ed.			
Age	A	B	C	Ideal	A	B	C	Ideal
60	.23	.16	.36	.42	.50	.24	.48	.69
62	.10	.07	.11	.06	.06	.07	.09	.06
65	.24	.30	.17	.16	.14	.30	.14	.04

These probabilities applied to individual faculty in the flow model determine the numbers of expected retirements and turnover rates.

Age 60 includes all those who indicated they would retire before age 60 as well. Age 70, under Oregon law, is the mandatory retirement age, so this becomes a 1.00 probability. It was decided to use existing probabilities for ages 63-64 and 66-69, since the probability of those remaining employed at that age will not decrease under the optional plans. The reason for including Ideal Age is that it is possible to combine these plans or to develop alternative plans that would allow Ideal Age retirements.

Computer Simulations. There are a variety of Faculty Flow models that have been developed, many using an age-cohort distribution of faculty. The University of Southern California model was selected for this study because it is based on individual cases. This will produce more specific information for institutional planning purposes. The University of Oregon and Oregon College of Education were selected for modeling purposes as examples of a larger, research-oriented university and a smaller, teaching-oriented college, respectively.

An overall view of the USC Faculty Model is shown in Figure 1. The model has two sets of inputs. One represents the present and anticipated environment. This includes the faculty data (age, salary, tenure year, rank, sex, race, school, and department), mortality table, quit rates, faculty needs, and time horizon. The other set is the policies to be followed: retirement, tenure, replacement, and promotion. Output includes data year by year over the time horizon on number of retirements, deaths, quits, tenure and tenure denial, promotion, number of openings, and faculty composition. For more detail on the model, see Gray (1976).

Because the USC model is based on individuals, the program can handle data on about 250 individuals at a time. Therefore, the UO was run in all components by schools and departments, and OCE in two sections. Five runs for each of these 13 components were made: Current, Plan A, Plan B, Plan C, and Ideal Age. This involved 65 runs. For each run, the planning horizon was 20 years--1980 to the year 2000. Initial data probabilities on quits, tenure, and replacement were held constant throughout. Promotion policy and faculty requirements were held constant. Faculty salaries were not increased over time. The only variables were in retirement.

4. What impact would early retirement have on faculty turnover rates at specific institutions?

Table 1 displays results of the computer simulation in terms of numbers of retirements at the University of Oregon and Oregon College of Education from 1980 to 1999 and Figure 2 graphs these data. Briefly, the 20-year totals for retirements and turnover percentages:

	Current	Plan A	Plan B	Plan C	Ideal Age
UO	198	241	232	261	269
	27%	33%	31%	35%	36%
OCE	45	69	60	63	74
	22%	34%	29%	31%	36%

Under the Current situation, the UO and OCE will accumulate a total of 198 and 45 faculty retirements, respectively, between 1980 and 2000. These numbers represent 27 percent of the faculty of the UO and 22 percent for OCE. Under Plan A, the numbers of retirements increase and turnover reaches 33 percent at the UO and 34 percent, OCE.

Plan B does not affect faculty retirements as much as either Plan A or Plan C. Plan B generates a total of 232 retirements at the UO and 60 at OCE for percentage turnovers of 31 and 29, respectively.

Plan C is the most effective at the UO but holds second place at OCE to Plan A. Possible explanations for this are explored below. The UO retirements are 261 (35% of the faculty) and OCE retirements are 63 (31%) under Plan C. It should be stressed that Plan C is currently available to OSSHE faculty members, but this benefit apparently is not widely known.

Ideal Age, which could be a combination of one, two, or all shown or another option, produces a 36 percent turnover rate at both institutions. It is interesting to note that a greater increase in turnover from the Current situation is generated at OCE. This is explored further in the faculty mix discussion.

Faculty Mix. AAUP (1978) describes three age distributions, categorizing them as Balanced, Young, or Mature faculties. Using the AAUP designation, the faculty input data for UO and OCE were analyzed. The UO, particularly in Arts and Sciences, has a mature faculty. In contrast, Oregon College of Education, particularly in Education, has a young faculty.

In order to analyze the effectiveness of Plans A, B and C for each institution, the number of retirements was aggregated over five-year periods. Then percentages of openings in the total faculty created in each of these periods were calculated. The cumulative 20-year numbers of retirements and cumulative percentage of openings due to retirements also were determined. Table 2 displays this information.

Under the Current situation, OCE has lower percentages of openings with the same retirement probabilities as the UO. Most plans in most five-year periods do not create as much turnover or openings for OCE as UO. This is in spite of OCE having higher probabilities for age 60 retirement under all plans. These anomalies can be traced to OCE's younger faculty mix.

Under Plan A where OCE's probability for age 60 was more than double UO's (.50 to .23), the difference is not felt strongly until the 1990-94 period. This is due to a large age 46-50 cohort at OCE reaching their 60's, and this impacts OCE by raising the percentage of openings well above UO. Under Plan B, the most common age for retirement was 65, and UO and OCE both had .30 probabilities at that age. In 1995-99, OCE outstrips UO in percentage of openings when OCE's large 46-50 age cohort reaches 65 and above. Under Plan C, OCE is nearly equal with UO in percentage of openings in 1990-94, again due to the OCE cohort that reaches their 60's at this time.

Thus, in considering retirement plans that appeal to faculty for age 60, 62, 65 or other retirement ages, the effectiveness in any given period will vary depending on the faculty age mixes of the institutions.

5. What would specific early retirement plans cost and what would be the potential benefits?

Cost analyses may be based on an assumption that positions freed will result in full salary savings or, conversely, that positions will be refilled with junior faculty if the institution is maintaining enrollments and requires replacement personnel. The latter "constant faculty" assumption was made for the cost analyses conducted in the present study. A companion assumption used was that institutions would elect to bring in young academics and to promote existing faculty into higher ranks vacated by retiring professors. Accordingly, replacement at assistant professor salaries was utilized for the funds freed analysis.

If a "contraction" assumption had been used that positions freed would not be refilled, larger savings would have resulted. In addition, if faculty salaries had been increased each year by an inflation factor, total dollar savings would appear larger.

For purposes of this cost analysis, average salaries are derived from basic data in the computer model.

	Low	Medium	High
Full Professor	$28,900	$30,900	$32,100
Associate Professor	18,700	19,800	21,900
Assistant Professor	14,400	16,100	18,200

Since some faculty retiring as early as 60 may be associate professors rather than full professors, the low full professor's salary of $28,900 is used as the average retiree's salary. In addition, the low assistant professor's salary of $14,400 is used as the replacement salary since it is assumed that young faculty will be brought in.

The average number of retirements per year at ages 60 to 70 over the 20-year totals are used to develop cost estimates for each plan for the UO, as examples.

Age	Current	Plan A	Plan B	Plan C	Ideal Age
60	-	4	3	6	7
61	-	-	-	-	-
62	1	1	1	1	1
63	-	-	-	-	-
64	-	-	-	-	-
65	1	2	3	1	1
66	-	-	-	-	-
67	-	-	-	-	-
68	1	1	-	-	-
69	1	1	1	1	1
70	4	3	3	3	3

- Means less than one per year.

Plan A (Part-time Employment) would produce an average of four retirements per year at age 60 compared to none under the current situation. One retirement at age 62 is the same as under current flow probabilities. Two retirements at age 65 is one more than current expectations. Ages 68 and 69 are the same as under current.

Plan A allows part-time pay of up to 25 percent of salary or $6,000, whichever is less. Since the average retiree salary is assumed at $28,900, $6,000 would generally be the less of most retirees' salaries. In addition, the institution is estimated to pay approximately $200 per year for medical and life insurance.

For this analysis it is assumed that of the four choosing this option at age 60, one will work until age 62; two until age 65; and the last until age 70. The extra person retiring at 65 will do part-time work to 70. Over a 10-year period, the cost calculation follows:

$6,000	Part-time Salary
+ 200	Medical/Life Insurance
$6,200	
X 27	(1x2 yrs; 3x5 yrs; 1x10 yrs)
$167,400	Plan A Approximate Costs for 1 Year's Group

In the same 10-year period, Plan A savings to the institution will be:

$28,900	Average Retiree Salary
- 6,200	Costs
$22,700	
X 45	(4x10 yrs; 1x5 yrs)
$1,021,500	Plan A Savings for 1 Year's Group

(Even though a person quits part-time employment at age 62 or 65, the regular salary saving is figured at 10 years--from 60 to 70.)

Assuming faculty requirements based on student enrollment remain unchanged over the 10-year period, the following net savings result:

$14,400	Replacement Salary
X 45	(4x10 yrs; 1x5 yrs)
$648,000	Plan A Replacement Costs
$1,021,500	Savings
- 815,400	Total Costs
$ 206,100	Net Savings, Plan A for 1 Year's Group

Plan B (Annuity Supplement is a 6 percent salary addition paid by the institution into a tax-sheltered annuity.

$28,900 x .06 = $1,734 cost per person per year

For illustration at the UO, let us assume the three indicating retirement at 60 actually agree to retire in two years--at age 62. The two at age 65 (over and above the current situation) announced at age 60 that they would retire at 65 and so will have the income supplement for five years.

Cost calculation for Plan B would be as follows:

$ 1,734	Per Year, Per Person Payment
X 16	(3x2 yrs; 2x5 yrs)
$27,744	Costs of Plan B for 1 Year's Group

$28,900	Average Retiree Salary
X 34	(3x8 yrs; 2x5 yrs)
$982,600	Savings under Plan B for 1 Year's Group

$14,400	Average Replacement Salary
X 34	
$489,600	Total Replacement Costs
+ 27,744	Plan B Costs
$517,344	Total Costs, Plan B

$982,600	
- 517,344	
$465,256	Net Savings, Plan B for 1 Year's Group

Plan C (PERS) permits faculty members under the Oregon Public Employees Retirement System to retire at age 60 or later and receive the pension benefits that they are entitled to based on years of service computed without actuarial reduction, which means computed as if they retired at the mandatory age of 70. This option is available currently under state statute, and costs are picked up from the PERS fund, rather than the institutional budget.

Under Plan C for the UO, six persons would retire at age 60, compared to none under the current situation.

$28,900		$14,400	Replacement
X 60	(6x10 yrs)	X 60	
$1,734,000	Savings	$864,000	
- 864,000	Replacement Salary Cost		
$ 870,000	Net Savings under Plan C for 1 Year's Group		

(There are no "Plan" costs since the PERS fund picks them up.)

These figures for Plans A, B and C also could be approximate _per year_ costs and savings as well. However, each year may vary depending on the faculty age mix at the institution and individual faculty decisions about retirement.

Systemwide estimates were extrapolated from the UO averages developed. These could be average annual figures as well, with the caveats noted.

Costs and Savings Systemwide
(Estimates for 1 Year's Group over 10-Year Period)

	Plan A	Plan B	Plan C
Retiree Salary Savings, less	$4,086,000	$3,930,400	$6,936,000
Replacement Salary Costs and	2,592,000	1,958,400	3,456,000
Plan Costs	669,600	110,976	0
Net Savings for State System	$ 824,400	$1,861,024	$3,480,000

For faculty retiring in the State System in the 20-year period (but figured over 30 years) net savings would be roughly:

Plan A	$16.5 million
Plan B	37.2 million
Plan C	69.6 million

Plan C generates the most savings, since costs of early retirement are borne by Oregon's Public Employee Retirement Fund. (However, added costs may be spread to other state employees contributing to PERS.) Even though fewer faculty are induced to retire early under Plan B than Plan A, Plan B results in greater net savings since plan costs are less than under Plan A, where retirees are paid for part-time employment and provided medical and insurance benefits.

6. What are the implications of early retirement for planning and budgeting in higher education?

Early retirement can be viewed as an academic personnel policy to free faculty ranks so that persons with needed skills can be recruited. In this vein, early retirement can be used by the administration to shift resources to needed areas, to new or expanding fields, or to programs that need rebuilding. By encouraging the early retirement of academics in out-of-demand fields, an institution can gain a few faculty positions to reallocate elsewhere.

When viewed as an academic personnel policy, the level of resources (faculty slots) is maintained. However, early retirement also may be seen as a fiscal policy. In a case where an institution is faced with a budgetary shortage, early retirement may be looked upon as a way to reduce payroll costs, assuming the institution can continue to function with a reduced staff or with lower cost staff.

Whether early retirement is used as an academic personnel policy to create turnover in faculty ranks or as a fiscal policy to save funds, research shows that early retirement options are potentially useful tools. By carefully setting benefit levels, by clearly stating the terms of an early retirement provision, and by approaching interested potential retirees, an institution may find advantages to carrying out an increased benefits early retirement plan.

Within systems of higher education, this study suggests that early retirement planning should not be limited to just one option, since one type of plan may be more useful to a research-oriented university with a mature faculty, while another may be better for a teaching-oriented college with a younger faculty age profile. In addition, because of faculty concern about equal treatment and uniformity, institutions should be free to use approved options. If one type of plan is provided in one institution, it should be possible for faculty in another system institution to have access to that plan as well.

Before jumping on the early retirement bandwagon, institutions and systems must be certain as to their needs, the price they are willing to pay for turnover, and how changes in the early retirement rates will affect faculty flow at their own institutions. Systems and institutions must examine their own and faculty members' needs and determine possible effectiveness of various options in terms of the factors reviewed in this study.

"Blueprint" for Institution and System Administration

1. Survey faculty
2. Determine probabilities for retirement
3. Project retirements for the future and impact of faculty flow by computer simulation
4. Develop cost analyses of alternative early retirement plans
5. Consider implications in terms of feasibility related to administrative, legal, political and market factors
6. Select appropriate early retirement plans and implement
7. Evaluate

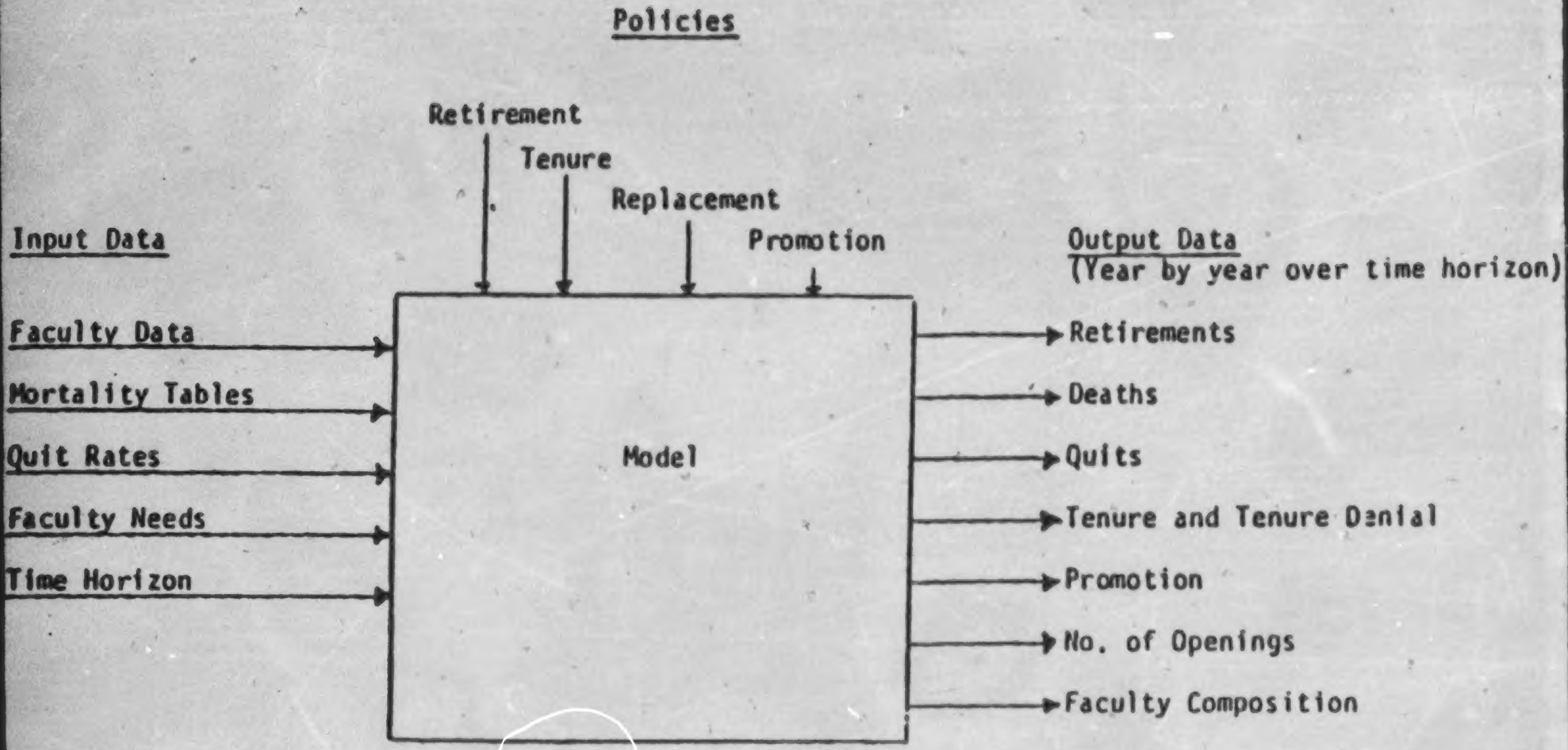

Figure 1 Basic Structure of the USC Faculty Model

Figure 2

NUMBERS OF RETIREMENTS UNDER THREE PLANS

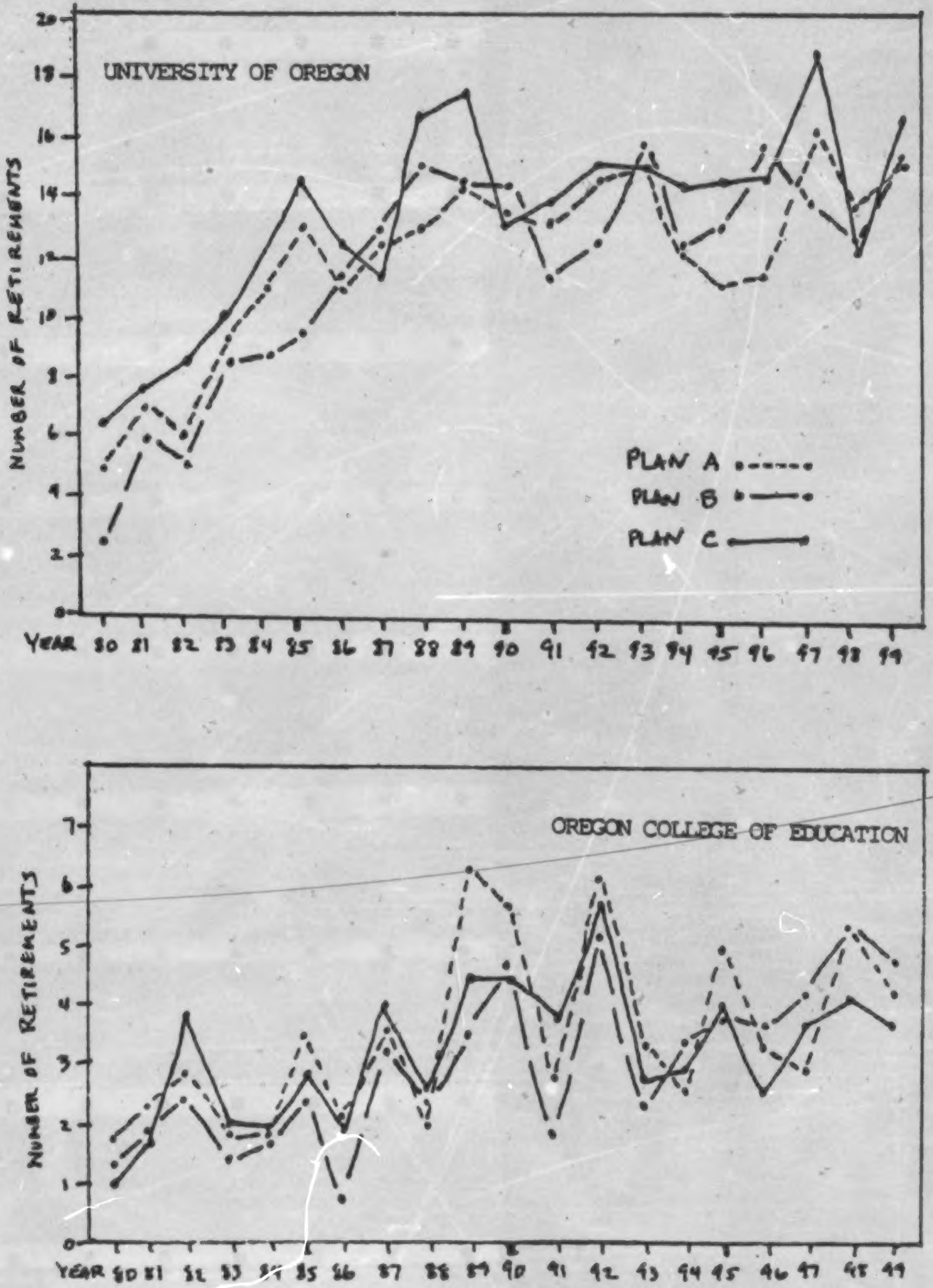

Table 1

NUMBERS OF RETIREMENTS 1980-1999

	U of O					OCE				
Year	Current	Plan A	Plan B	Plan C	Ideal	Current	Plan A	Plan B	Plan C	Ideal
1980	1.3	4.8	2.3	6.2	7.7	.3	1.7	1.2	1.0	1.7
81	3.5	7.6	6.0	7.4	7.9	2.2	2.2	1.9	1.9	2.2
82	3.4	6.1	5.1	8.4	10.0	1.1	2.8	2.5	3.9	4.7
83	3.7	9.3	8.4	10.0	10.3	1.1	1.8	1.5	1.9	1.7
84	4.2	10.6	8.6	9.0	10.1	1.0	1.9	1.9	1.9	1.5
85	5.5	13.0	9.6	14.7	12.1	1.0	3.5	2.3	2.9	3.3
86	10.1	11.1	11.5	12.3	13.2	1.4	2.0	.9	2.0	1.9
87	9.2	12.7	13.0	11.5	13.5	2.3	3.6	3.4	4.1	4.8
88	8.8	13.1	15.2	16.7	14.3	1.7	2.0	2.2	2.6	3.6
89	12.1	14.7	14.6	17.6	16.7	3.0	6.4	3.5	4.5	7.6
90	12.1	13.7	14.5	13.7	14.5	1.5	5.7	4.7	4.5	5.9
91	12.5	12.9	11.3	14.0	13.5	1.4	2.9	1.8	3.9	3.5
92	13.8	14.6	12.9	15.0	14.8	4.3	6.1	5.1	5.8	6.7
93	15.4	15.5	16.0	14.8	17.9	2.8	3.3	2.3	2.7	4.8
94	15.9	12.2	12.1	14.4	13.2	2.8	2.6	3.3	2.9	2.1
95	13.8	11.5	13.2	14.6	13.2	3.8	3.0	3.8	4.0	4.4
96	10.0	11.7	16.0	15.3	19.2	1.9	3.4	3.7	2.6	2.9
97	14.6	16.3	14.0	18.9	17.2	2.9	3.0	4.1	3.7	4.1
98	13.7	13.8	12.9	12.2	14.4	2.6	5.3	5.3	4.1	3.0
99	14.8	15.4	15.7	14.8	15.4	5.4	4.2	4.9	3.7	3.8
Total	198	241	232	261	269	45	69	60	63	74
a	27%	33%	31%	35%	36%	22%	34%	29%	31%	36%

[a] Turnover—percentage of 739 faculty for UO and 206 for OCE.

Table 2

COMPARISON OF RETIREMENT PLANS
UO AND OCE OVER FIVE-YEAR PERIODS

	1980-84		1985-89		1990-94		1995-99		20-Year Period	
Inst.	No. Retired	% Opened[a]	No. Retired	% Opened	No. Retired	% Opened	No. Retired	% Opened	No. Retired	% Opened
					Current					
UO	16.1	2.2%	45.7	6.2%	69.7	9.4%	66.9	9.1%	198.4	26.8%
OCE	5.7	2.7	9.4	4.6	12.8	6.2	16.6	8.1	44.5	21.6
					Plan A					
UO	38.4	5.2	64.6	8.7	68.9	9.3	68.7	9.3	240.6	32.5
OCE	10.4	5.0	17.5	8.5	20.6	10.0	20.9	10.1	69.4	33.7
					Plan B					
UO	30.4	4.1	63.9	8.6	66.8	9.0	71.8	9.7	232.9	31.5
OCE	9.0	4.4	12.3	6.0	17.2	8.3	21.8	10.6	60.3	29.3
					Plan C					
UO	41.0	5.5	72.8	9.9	71.9	9.7	75.8	10.3	261.5	35.4
OCE	10.6	5.1	16.1	7.8	19.8	9.6	18.1	8.8	63.7	30.9
					Ideal					
UO	46.0	6.2	69.8	9.4	73.9	10.0	79.4	10.7	269.1	36.4
OCE	11.8	5.7	21.2	10.3	23.0	11.2	18.2	8.8	74.2	36.0

[a] Percentage of 739 faculty for UO and 206 for OCE.

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Research Papers

Policy-Impact Analysis: An Approach to Planning and Budgeting in Higher Education

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Policy-Impact Analysis: An Approach to Planning and Budgeting in Higher Education

The decade of the 1980's promises to be one of change and uncertainty for higher education. Shifting demographics, changing enrollment patterns, changing programmatic demands and fiscal constraints will be the norm. Given that state level systems of higher education have proliferated and state legislatures have assumed a role of increasing importance, it can be assumed that state level policies impacting on higher education will come under increased scrutiny. In the coming decade, the individual institution's relations to other institutions and to the social environment will become a key concern. It is incumbent on those responsible for the state-wide planning and budgeting process in higher education to use the best available analytical techniques in assessing and developing policies. Present inflationary losses, if continued through the decade, could leave colleges and universities with one-half the revenues (in real terms) they now have (Dede, 1981). Furthermore, given the current economic difficulties of the country as a whole, education, and particularly higher education, has no strong claim to extra funding by federal or state governments. Given the declining percentage of parents with college age children, the increased aging of the American population, and the fact that discretionary income for U.S. households has declined markedly since 1972, the public's ability to support higher education by contributions, taxes, and increased tuition has also declined.

These financial problems are compounded when one examines demographic projections of the historical college age group. For example, it is estimated that this age group, the 18 to 24 year olds, will decline some 15 percent (or 2.6 million) during this decade (Johansen and McNaulty, 1977). This decline undoubtedly will affect enrollment in higher education since 48 percent of the total enrollment (and 64 percent of the undergraduate enrollment) came from this age group in 1975. Given the projected decline in financial aid available to students, further reductions in enrollment might be anticipated. These problems are accentuated by a growing perception in our society that a college degree no longer has the value it once had. Furthermore, the Bureau of Labor Statistics (1975) projects the surplus of college graduates to reach 140,000 annually by 1985.

Higher education began to face these realities in the 1970's as noted in much of the literature of the field which focused on maintaining a "steady state." The 1970's also witnessed the decline of faculty mobility in the academic marketplace. This decline has led to a concomitant problem in the 1980's, i.e., the "tenuring-in" of college faculties. Consequently, it is difficult to introduce new, energetic, highly trained, young doctorates of all races, sexes, and creeds into faculties. There is concern of academic stagnation of many of our campuses, and a good deal of agitation with respect to the problem of under-representation of women and minorities on college and university faculties.

Along with the projected decline of enrollment of traditionally-aged college youth is an accompanying change in the composition of the college student population in that there are increasing numbers of over-35 year old adults, minorities, and women enrolling. This changing mix of the student population, with accompanying demands for innovative pedagogical strategies, changing the curriculum, and even changing the time during which classes are offered, will in turn create additional administrative problems on college campuses.

In sum, then, the decade of the 1980's promises to be one of change and uncertainty for the country as a whole, and for higher education in particular. The challenge of the 1980's will be to develop policies to cope with the changing environment within which higher education exists, while providing the knowledge and skills the citizens of this country need in order to meet the demands of a complex, increasingly technological, and somewhat unstable world. The problem, basically, is the management of change. Society and higher education's place in it are going to change, regardless. If change can, in some measure, be anticipated, then institutions of higher education can offer the programs and services that will meet the needs of individuals in the emerging society and retain a viable place within society.

This paper presents a model for developing and assessing policies at the state level consistent with the fiscal realities of the 1980's and the formal and informal power structures in higher education. Adapted from the work of Renfro (1980) this model, the policy-impact analysis model, provides a framework within which a variety of futures research techniques are combined with the extant postsecondary simulation and modeling systems. The utility of the model is that it structures communication between those developing information about the future and those formally and informally responsible for policy formulation and decision making.

The Policy-Impact Analysis Model

There are four stages in the policy-impact analysis model: monitoring, forecasting, goal setting, and policy analysis and implementation. Monitoring refers to the identification and selection of issues of concern either to policy makers or scholars. For example, if entering freshmen enrollments in liberal arts programs appear to be declining, university officials may choose to focus on this issue as appropriate for study and possible action. The second stage of the model, forecasting, involves using a variety of futures research techniques to forecast probable futures and their relationship to selected issues. In response to the projected trends and probable futures, policy makers then establish goals, the third stage of the model. For example, using the futures research techniques described below with liberal arts programs experiencing decreasing enrollments, state system level officials, upon receiving this information, may then establish goals for maintaining enrollments in liberal arts programs or focusing efforts on other programs. This leads to the fourth stage of the model, the analysis and implementation of policies to achieve those ends. In this stage, a variety of possible policies are analyzed in order to determine their probable impact, and are ranked on those characteristics deemed important, e.g., relative costs versus benefits. Those policies ranked at the top are then implemented. Evaluation occurs when the stages of the model are repeated using additional analyses and further refinements. This model will be described and illustrated in more detail below.

Stage I: Monitoring

Monitoring consists of first, in conjunction with policy makers, identifying areas for study; selecting appropriate indicators of those issues of concern; and developing a data base that includes those indicators. There are constraints in this process. Primary among these is the availability of historical data that is reliable and valid. This point need not be belabored. Several writers in the field of higher education have dealt thoroughly with criterion for developing and assessing reliable and valid historical data, among them Halstead (1974) and Adams, Hawkins and Schroeder (1978). As well, the monitoring stage does not proceed in a linear fashion through issue identification, indicator selection and data base development. Issues often arise through a perceived need within the state. Available data is used to generate some indicator of need or of a situation that must be changed. At this point events usually proceed in some linear fashion through indicator selection and the acquisition or development of a data base.

The development of an effective system of indicators for use in educational policy development dictates adhering to several additional principles. First, indicators should be policy relevant. The primary focus of a data base of educational indicators or use in policy analysis should be on choices policy makers must deal with. Much research concerns relationships that are not within the control of policy makers, and indicators of such relationships are relevant to policy making only as they establish the "givens" of the situations, the constraints in which policy alternatives actually exist.

Second, indicators must be intelligible to policy makers. Indicators must be useful to decision makers who often spend large amounts of time reviewing many, perhaps contradictory, measures of conditions. Even though they may be derived from an extensive and complex archive of data that does include many measures, the indicators reported should be few in number and expressed with a minimum of jargon.

Third, wherever possible, indicators should be derived from existing data sources. There are three reasons for this. First, such a procedure is cost effective. Data gathering is expensive. Second, novel data sources will introduce errors until new procedures are standardized and widely understood by those supplying the data. Third, if indicators can be defined or derived from existing data collections, it is possible to measure past events using straight-line extrapolation, as well as more complex time-series and trend fitting strategies.

Fourth, wherever possible, indicators should be located within connected models of educational events. Some indicators in a single perspective are useful as observations simply because they warn us something is going on. Wherever possible, indicators should be developed within models of interconnected events. For example, industrial growth creates population migration which generates enrollment while changing enrollment patterns and, perhaps, changing educational needs. Each of the underlined words marks a possible causal relationship within the model. Attempting to measure the critical interconnections cf the social system that effect educational events, so that future demands and future needs can be predicted, is an ambitious and necessary goal.

Fifth, wherever possible, indicators should be sensitive to the possibility of unexpected changes in the system. Having expressed the need for model building in the fourth principle, the need for model breaking, or at least model reevaluation, must be considered. The most serious shortcoming of most policy indicator systems has been their static nature. Failing to allow for shifts in relationships within models has contributed to the belief that policy indicators are unrelated to reality and have little value in long-range planning.

All policy development requires information of some sort, whether or not the information is supplied formally. Some decisions require only a small amount of information, and some require a great deal. To understand why there is a difference, it is necessary to realize that, at the most general level, the purpose of information is to reduce uncertainty. As uncertainty increases, the need for information also increases. More complex situations inherently involve more uncertainty, as do more unstable environments.

Information is also needed to facilitate the process of negotiation by helping the interested parties assess more rapidly and accurately which among the possible propositions that are advanced stand some chance of being accepted. In other words, information is needed not only on social, economic and technical trends, but also on value systems (Eckstein, 1974). This leads, inexorably, to the second stage of our model, that of forecasting.

Stage II: Forecasting

Forecasting is intrinsically tied to policy development. As Peter Drucker noted, "all our knowledge is about the past; all our decisions about the future." Yet of the information available to policy makers, forecasts are the most suspect because they depart from what is knowable. We may, at some point in the future, find that we chose correctly from previous patterns and extant relationships in developing a forecast. But that knowledge is, to most of us, as yet unattainable. It is this problematic nature of forecasting that is faced by policy makers. Given that various different forecasts of the same trend or value are available, Ascher (1975) characterizes the burden of the policy maker as greater than the original task of forecasting. He suggests that the policy maker attends to those forecasts that appear reasonable and so tacitly choose assumptions and methods for forecasting.

A number of forecasting techniques have been developed over the last decades and can be separated into the two general classes of quantitative techniques and qualitative techniques. Quantitative techniques include those techniques that are based on the mechanical manipulation of historical data. Among the more widely used quantitative techniques are regression analysis, exponential smoothing and decomposition methods.

Basically, quantitative techniques for forecasting embody the procedures and properties of one or both of two models. The time-series model, a model which assumes that a pattern recurs over time, is perhaps the most common. Time-series techniques allow discerning a pattern and its time period. A starting point can then be chosen with this model and a value forecast for some point in the future. This model explicitly assumes that a pattern can be identified on the basis of historical data and does not account for present actions.

A second model, the causal or explanatory model, assumes that variables other than time are important in forecasting. These techniques require data on several variables in addition to the variable being forecast. They allow developing a number of different forecasts given the relationships postulated. Causal models generally take longer to develop and are more sensitive to change in underlying relationships than time-series models.

Qualitative forecasting techniques are used to forecast changes in a basic pattern as well as the pattern itself (Wheelright and Makridakis, 1980). These techniques are most often used in cases where historical data that directly represent the variable to be forecast is not available. Among the qualitative techniques currently used are: (1) the exploratory use of curve fitting techniques, or curve fitting with minimal data and subjective review of the extrapolated curve; (2) morphological analysis, or a systematic manner of enumerating all combinations of possibilities for the variables and situations being forecast (Zuicky, 1967); (3) Delphi and cross-impact approaches that use expert opinion to gauge the subjective probability of an event's occurrence and the magnitude of its effect; and (4) the purely normative approach of decision tree construction using the ideas of decision theory to sketch out the objectives and sub-objectives a panel of experts see as necessary to attain a chosen goal or future.

Given the wide range of forecasting techniques, it is important that the most appropriate technique or combination of techniques be applied to a given situation. Wheelwright and Makridakis (1980) list six properties of forecasting techniques that must be considered in preparing a forecast. First, the underlying pattern of the data must be recognized. Using quantitative techniques, explicit assumptions are made about the underlying pattern of the data while qualitative techniques allow patterns to take virtually any form and rarely require that these be identified explicitly. Second, the accuracy of the method must be assessed. The accuracy of a technique in predicting patterns and relationships similar to those in historical data is one form of accuracy. Another is the success of a method in predicting when the pattern changes and past error calculations are inappropriate. Third, the appropriate model or models to be used in preparing a forecast (i.e., causal or time-series) must be identified. Fourth, the costs of a forecasting technique must be carefully considered. Development costs, the cost of acquiring and storing data, and analysis cost, or the cost of running a technique, must all be estimated. Fifth, the time period for which a forecast is being prepared should be delineated. Some techniques are appropriate for short-term forecasts whereas others are more appropriate for longer term forecasts. The sixth, and last consideration is the applicability of the chosen method to a given setting. In general terms, are the hardware and software, expertise, and understanding of the techniques accessible?

In the goal setting stage, it is useful to categorize forecasting techniques not only as quantitative and qualitative, but also as exploratory and normative (Holroyd, 1978; Lanford, 1972). Exploratory forecasting in this framework consists of analyzing trends and cycles to determine what might happen. Normative forecasting can be seen as defining a desirable future and the obstacles to its achievement, and so determine what should happen. At this point there can be no illusion that we have left the knowable. The goal setting stage requires: (1) that we attempt to determine the social milieu within which higher education will function in the future and (2) that we determine the role of higher education in that milieu. In Stage IV, policy analysis and implementation, actions within each year's predicted, but as yet unknown, environment must be plotted which can lead to that role. Goal setting begins with exploratory forecasts and moves into the use of normative forecasts. Policy analysis and implementation employ purely normative forecasts as appropriate policies are decided.

In developing policy useful exploratory forecasts, the interrelatedness of various trends become crucial to forecast accuracy. The examination of forecast methodologies has demonstrated that no forecasting task stands alone from all others (Ascher, 1978). For example, demographic forecasts are based on economic, technological and social assumptions. Determining the component trends that provide the background to a forecast and the potential magnitude of error for each component are relatively straightforward but essential tasks. As well, one must also be concerned with choosing the individual forecasts that will be blended into an overall environmental forecast. The American Association of State Colleges and Universities recently developed an excellent guide to assist institutions in long-range planning (1978). An example using forecast areas that may be of particular concern to long-range planning for higher education, developed by John Osman, was included in this planning guide. These areas of concern contributing to the overall environmental forecast included forecasts of: population; governance structures; international affairs; the physical environment; energy use and supply; the economy; advances in science and technology; trends in human settlements; trends in the world of work; lifestyle changes; and patterns of participation in private and public enterprise. The trends that are emphasized in an overall environmental forecast might differ between states. For example, the urbanization trend in human settlements may be a driving force in one state and not in another. Within each state's system of higher education is a vast store of expertise and a state embarking on a policy-impact analysis approach would be expected to develop thorough exploratory forecasts for the state and its subregions.

Stage III: Goal Setting

The first two stages of a policy-impact analysis model, monitoring and forecasting, perform the role of organizing, structuring, and articulating images of the future with respect to a particular set of assumptions and indicators. The next stage of the model, goal setting, revolves around the process of setting realistic goals given the information provided in the first two stages of the model. This stage requires the generation of a desirable future, or futures, in a procedure much like that of forecasting using the delphi method. This process may involve actors from all the power loci concerned with the future of higher education in a state. The groups involved might include representatives from institutional administration, the faculties, legislature, Governor's Office, Office of the Chief State School Officer, state system's staff, as well as authorities from business, industry, and public interest groups. The rationale for this stage is based upon the importance of having a concept of a desirable future with respect to a particular issue in order to develop policies. A desirable future in this case can be defined as one in which higher education maintains a meaningful and accepted role within the social system. This does not mean, necessarily, the role it has today. The central characteristic of colleges and universities in this country has been change. This characteristic, we can be relatively sure, will not change.

The approach up to this point has been straightforward. As we approach goal setting and then normative forecasting, however, the model becomes more fluid. Ascher (1978) characterizes normative forecasting techniques as decision making procedures in that projections are developed to assist in achieving a given set of goals, or to define what set of goals can be achieved. In a corporate setting this would be the domain of top-level management supported by a strategic planning officer or team of consultants. Embodied in the policy-impact analysis approach is the assumption that a number of formal and informal power loci within a state set the goals of higher education and determine what actions will be taken in attempting to reach those goals. The key to this particular process is the inclusion of participants from all the concerned power loci in the identification of likely events and in reviewing results. In this way it is hoped a more cooperative approach to higher education planning and budgeting can result. It is also assumed here that the coming decade will be one of increased competition for available funds. This process assumes that those sectors which occupy a clear and necessary niche within the state and present their case for a share of the available funds in a unified and persuasive manner, will receive funds. In the coming decade momentum alone will not assure that an agency or institution receives its share. Put more bluntly, if the various members of the postsecondary community enter the legislative arena "at odds," they can be assured of living in a state with an excellent system of roads and a well financed system for social services.

In this stage of the model, then, an exploratory forecasting process using quantitative forecasting techniques and some qualitative assessments of possible impacting events would be used to develop a view of one or several possible future environments. Taking each of these integrated sets of events and conditions and developing a story or "scenario" around them has proven a successful aid in grasping what a possible future might be like. Providing policy makers with exploratory forecasts and involving them in the generation of future scenarios has also proven successful in developing their awareness of future conditions (Masterton, 1981).

With an awareness of each probable future environment, realistic goals can be outlined for each set of possible conditions. It would be expected, under this model, that the disaffection within the various power loci would be minimized when environmental constraints are recognized. It would be hoped that the most creative and service maximizing configurations would also be the result of recognizing environmental constraints. At this point a normative forecasting process would be used involving qualitative forecasting techniques such as the delphi, morphological methods, cross-impact and trend-impact analysis and decision tree analysis.

Stage IV: Policy Analysis and Implementation

The first three stages of this model serve to identify specific trends, the events which may affect those trends, and the goals of the organization. As such, these steps specify policy options and responses. In the final stage estimates are made on how a particular policy may impact a given trend through influencing the probability of the occurrence of one or more specified events affecting the trend. As may be noted in Figure 1, there are three ways policies may affect trends: directly, directly and through events, and through events only.

The initial task in this stage, then, is to identify those events which may have positive or negative effects on those trends or state of affairs related to organizational goals. For example, if an event adversely affects an existing trend which was beneficial to the organization, then policies which would make the event less likely to occur, or which would delay or mitigate the effects of the event, should be developed. Conversely, if an event has the effect of enhancing a given state of affairs, or a trend consonant with organizational objectives, policies should be developed which would increase the probability of the event occurring, and its impact. The probable relationships of policies and events may be tracked in a policy-to-events impact matrix, a matrix which enables the staff to generate new estimates of the probabilities and impacts of events modified by the policies. These estimates can be calculated on the basis of multiple conditional probabilities using Monte Carlo techniques. Most cross-impact analysis packages follow this strategy.

The effect on trends of events that would not be expected with a purely extrapolative forecast can, at this point, be estimated using probabilistic forecasting techniques such as trend-impact analysis. In this normative forecasting strategy a trend is extrapolated and then, in a delphi or cross-impact like process, the likely occurrence of an event that would impact on that trend is generated. An estimate of when that event might occur and its probable impact are also generated and the trend line modified with these estimates. The result is an impacted or "surprise free" forecast.

The end result of this somewhat complex activity is a policy-impacted forecast for a particular trend given the implementation of specific policies designed to affect that trend directly, or indirectly by impacting on events which effect the trend. The policy-impacted forecast then, not only incorporates those features of probabilistic forecasts, but also includes estimates of the impact of policies on events effecting the trend.

When the selected policies are implemented, the process of monitoring begins anew, enabling the evaluation of the effectiveness of the policies by comparing actual impacts with those forecasted. This requires that a data base of social/educational indicators be updated and maintained in order to evaluate the forecasts and policies and to add new trends as they are identified as being important. Implementation of this model also requires that current and past events be reevaluated, and that probabilistic forecasts be updated in order to enable goals to be refined and reevaluated. In essence, this process allows the higher education community a maximum hand in defining its place within the evolving social environment.

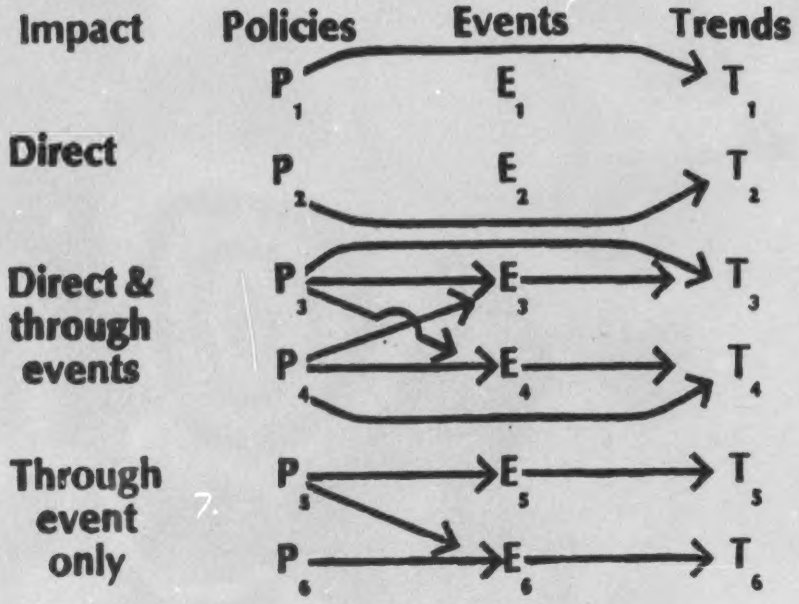

Figure 1. Three Ways Policies Impact Trends

To those familiar with long-range planning techniques, the policy-impact analysis model offers nothing new or startling. Instead, it ties together current forecasting and planning techniques and provides a model for their systematic use in the policy making process. In fact, similar models have been postulated. What may be unique is the assertion that the policy-impact analysis model should be put into place and used, now, for state level planning and budgeting in higher education. Moreover, we believe that the data, software, and even focus for implementing this model are present in most states. In the next section an example of how this model might be implemented will be presented.

Florida: A State Level Example

In selecting a state to illustrate how the policy-impact analysis model might be implemented, Florida was chosen for three reasons. First, higher education in Florida is currently facing an environment similar to one that higher education in the rest of the nation will face in the 1990's. Second, the state level political and policy setting process already uses some forecasting and simulation techniques. Third, the new Postsecondary Education Planning Commission could provide an excellent focus for this ongoing process.

A demographic profile of the state of Florida in 1981 has many of the characteristics that the country as a whole will have at the end of the decade. Migration of older Americans into Florida has given the state an older average age level than the country as a whole and, concomitantly, a growing percentage of people in the higher age categories. Nationally the percent and number of Americans in higher age groups is rising. This natural process will give the nation an age profile in the 1990's similar to the one in-migration has given Florida in 1981. The rate of decline in numbers of people in the traditional school age groups, 5 to 14 years old and 15 to 24 years old, will ease nationally in the 1990's. In Florida in-migration including people in these groups has already minimized the effect in the 15 to 24 year old group and kept the 5 to 14 year old group increasing. Immigration of Spanish speaking people to Florida has created a similar phenomenon. Immigration and a higher than average fertility rate will make Hispanic Americans the largest minority group in the nation at some point in the next two decades. In much of Florida this is already a reality.

Although forecasting economic trends beyond a year or two is difficult, most economic and business forecasters agree that the services and trade and high technology industries will be the high growth industries in the 1990's nationally. Florida's urban growth and tourism have already made the services and trade industries the largest employers in the state. Florida ranked fourth, nationally, in the number of new jobs (110,000) created by new manufacturing industries between 1968 and 1978. Many of these were high technology industries. In 1980, 447 new industrial plants and 80 plant expansions provided for over 20,000 new jobs. It would seem that the employment and economic profile of Florida in 1981 is similar to what we expected the national profile to look like in the early 1990's.

Florida's population and economic profile certainly bear similarity to the national profile forecast for the 1990's. If the state's fragile ecology is also considered, the state's housing, natural resources, transportation, recreation, and health and welfare profiles also bear a striking similarity to those forecast for the nation as a whole in the early 1990's. It is not out of line to consider that higher education in Florida is facing in the 1980's the realities that most of the rest of the nation will begin to face at the end of the decade. From our point of view, Florida would provide an excellent opportunity to field test the policy-impact analysis model in an environment that is already demanding that higher education review its functions and priorities.

Politically, as well, the Florida environment seems conducive to the policy-impact analysis approach. The Florida Postsecondary Education Planning Commission came into being in the last year and is responsible for planning for all of postsecondary education. This commission enjoys the strong backing of the Governor, the Commissioner of Education, and both houses of the legislature, and provides the kind of focus that the policy-impact analysis process should have. As well, over the last decade, the use of computerized simulation and forecasting models within the process of political negotiation have proliferated in Florida. Among the professional staff that support the state level process it is felt that forecasting and simulation models have come into wide use in Florida because of the advantages they provide. Primary among these advantages is that they ease communication. It is felt that when each of the actors, or groups, that approach an issue in the political process do so with their assumptions and data laid out, communication and compromise become easier.

The Postsecondary Education Planning Commission is resopnsible for developing a state higher education master plan by 1982. This master plan is being conceived of in four parts. First, a detailed profile of the current status of postsecondary education in the state will be developed. Second, an assessment of the current strengths and weaknesses of higher education in Florida with an analysis of the current adequacy of access, quality and efficiency of programs and institutions will be made. Third, the postsecondary education needs of the state to the year 2000 will be projected reviewing forecasts of changes expected in the state's population, economy and employment patterns. Fourth, and last, a plan of action will be proposed with specific recommendations aimed at improving the efficiency and effectiveness of programs and institutions and providing for an ongoing planning and evaluation process that includes full citizen involvement. It is at the level of the third and fourth parts of this new master plan for higher education in Florida that a clear focus for implementing a policy-impact analysis process is found. Each of the four stages of the policy-impact analysis model will be presented below with components available in Florida inserted into each stage along with proposed activities.

Stage I: Monitoring in Florida

As noted earlier, the monitoring stage consists of identifying areas for study, selecting appropriate indicators of those issues of concern, and developing a data base that includes those indicators. In essence, components for this stage of the model have been evolving in Florida over the last decade. The Florida Department of Education's Office of Strategy Planning and Management Information Systems has, since 1975, been involved in identifying social, economic and technological trends that may impact on the future of education in Florida, including higher education. This office's staff has worked with a number of university faculty within the state analyzing and identifying trends and issues. Several state-wide conferences where trends were reviewed and issues identified have also been sponsored in recent years by the Florida Department of Education. As well, the Governor's Office of Planning and Budgeting is currently preparing a state-wide outlook for the 1980's identifying issues and trends with data provided by the various state agencies.

Basically, Florida is a data rich state having committed to state-wide planning early in the 1970's and set up mechanisms for gathering and analyzing data in a number of areas. Most of this data is recognized as among the best available state-wide data in the country. The Institute for Social Research at the Florida State University and Bureau of Economic and Business Research at the University of Florida are also recognized for their wealth of demographic and economic information and expertise, and provide support to the state agencies in issue identification and data collection. Both the Division of Community Colleges and State University System maintain excellent fiscal, facilities, student, and personnel data with comparable historical data available for each institution. The State-wide Common Course Numbering System provides the most thorough nomenclature for identifying the content of course offerings available in the country.

It must be reiterated at this point that the monitoring stage does not proceed in a linear fashion through issue identification, indicator selection and data base development. Though issues, or areas of public concern, most often arise out of some perceived need in a state, the available data is often used to generate some indication of a need, or a situation that must be changed. Once an issue is identified, the events can proceed in some linear fashion through indicator selection and the acquisition or development of a data base. In this light, it can be seen that the state level issue identification and data base development efforts of the last decade in Florida have provided a rich and positive environment for higher education planning and analysis.

A growing movement toward sub-state regional efforts can provide additional sources for issue and indicator identification. Regional planning commissions serving as a focus for city and county planners have become centers for the identification of social, economic and geophysical issues and information in Florida. In recent years the higher education community has begun to develop coalitions based on regional concerns. One example is the Southeast Florida Educational Commission which is comprised of four universities and two of the largest community colleges in the country. This group published a report in May of 1981 with regional demographic, social, economic and cultural data and implications for postsecondary education. Not only were issues identified given the trend data, but the assumption that postsecondary education will change overtime was explicitly stated.

Given the wealth of data available in Florida the question of the reliability and validity of the data must be approached. Reviewing the merits of each data base that might be used, however, is beyond the scope of the current paper. It should suffice to say that in Florida, during this last information conscious decade, the criterion for developing and assessing reliable and valid historical data in the literature have, in most cases, been attended to. A similar assertion could be made concerning the five previously mentioned principles that should be adhered to in choosing indicators for use in educational policy development. In sum, the vigorous issue identification, indicator selection and data base development activities in Florida have already provided the monitoring stage of the policy-impact analysis model. In planning for higher education in this state, the last three stages can, then, be focused on.

Stage II: Forecasting for Florida

Forecasting the future need for higher education in Florida is primarily an exploratory forecasting task in that trends and cycles must be analyzed in order to forecast what the state might be like in coming years. Current trends and cycles must be projected and estimates of events that might impact on and change these trends and cycles must be made. With the data available in Florida, there are a number of quantitative forecasting techniques employing time-series and causal or explanatory models which could be used to generate a profile of the state in the coming decade. Several qualitative forecasting techniques are available which could be used to estimate the probable occurrence, and magnitude of effect, of events that could alter these forecasts.

Demographic, economic and labor force characteristics are basic components of a state profile and forecasting trends in these areas is a concern at several sites in the state. Population estimates and forecasts are prepared at both the University of Florida's Bureau of Economic and Business Research (BEBR) and the Institute for Social Research (ISR) at Florida State University. The state's official population estimates and forecasts are produced by the Population Division of the Bureau of Economic and Business Research. These figures are derived using equations based on both time-series and causal models. Assumptions based on measurable relationships (i.e., cohort survival rates) and inferred relationships (i.e., the relationship between electrical hookups and in-migration) are included together with time-series data to produce population estimates by age, race and sex for each county in the state. The Center for Population Studies at Florida State's Institute for Social Research is known for its work in determining both measurable and inferred relationships that can be used to refine population estimating equations. Population estimates based on various assumptions are available through the year 2000.

Several methods for forecasting enrollment in institutions of higher education are used in Florida. Since legislative funds are allocated on the basis of projected enrollments, the various strategies used to forecast enrollment focus on accuracy over the span of the Appropriations Act, in this case two years. The State University System's (SUS) enrollment forecasting procedures is based upon the ratios of actual enrollment to specified pools of eligibles at different levels. For forecasting purposes beyond the immediate budget cycle, the SUS procedure offers tremendous flexibility allowing different assumptions on participation and programs to be examined. As well, using this procedure it would be possible to incorporate enrollment forecasts with forecasts in areas outside of higher education.

Economic forecasts beyond a year are, at best, difficult to make. Estimating revenues in order to develop Florida's biennial budget, and a state law requiring that each new bill introduced into the state legislature be accompanied by an impact statement relating benefit to cost, demand that the best possible economic forecasts be developed. The Florida Department of Administration, Department of Education, and the Florida Legislature's Division of Economic and Demographic Research all have access to several sophisticated econometric models of the state and nation's economy. A number of assumptions about relationships between variables that affect the state economy are held in each of these models. One econometric model used by the Florida Legislature, for example, solves for 160 simultaneous equations. Over the short run of one or two years the forecasts provided by these models have proved relatively accurate. Of course, over time the relationships that provide the assumptions in the current models could change and less reliability should be assigned to a longer term forecast.

Using a time-series model and data collected monthly, the Florida Department of Commerce forecasts occupational and labor force trends for the state. Alternate forecasts are also derived using assumptions based on trends in labor force participation rates by age group, sex and total population.

The Florida Legislature is currently attempting to integrate these basic demographic, economic and labor force figures with information on prior demand for state government services. The expected result will be a model to forecast demand for service in each of the major program areas served by state government, including higher education. By adding various projected unit cost figures to this model the legislative staff could then forecast what it would cost to provide services given various cost assumptions.

Most of the institutions, the community colleges' and universities' state system staff, the legislature and Department of Education have some computer budget modeling or cost analysis capabilities. Software for the State Planning System (SPS), a simulation and optimization computer model developed by the National Center for Higher Education Management Systems, is also available in the Department of Education. If information on future demand for programs, participation rates by age, race and sex, and projected costs were provided, these computer models could produce a fairly detailed forecast for higher education in a future year. This, of course, points toward the need of those concerned with planning for the future of higher education to attend to a comprehensive state forecast.

It is important to begin any discussion of the state's future by attending to forecasts of the central demographic, economic, and labor force characteristics. Given the complexity and interrelations in any entity as large as a state, however, the forecaster must also look for factors that might limit or alter these basic trends. Florida's fragile ecology and energy dependence could certainly limit, or alter the pattern of Florida's future. South Florida's rapidly depleting water supply could radically limit growth in this region. Industrial and residential growth in Florida have often come at the expense of recreational lands and waters. In a state heavily dependent on an outdoor activity based tourist trade, decisions relating to land use become critical. As well, with agriculture the largest revenue producing enterprise in the state, after tourism, the significance of encroachment in agricultural areas cannot be minimized.

Fortunately for the forecaster, Florida has the most thorough environmental and land use data in the country. Merging this information into a forecast with economic and demographic information requires that qualitative forecasting techniques be employed. Merging various disparate forecasts requests that some overall model of the interrelationship and impact of various areas be developed. General systems theory provides a well developed tool for such complex model building. Several recognized researchers in this area can be found on Florida University campuses. Once a model of the interrelationship of forecast areas is developed, impact points and their magnitude can be estimated using analysis strategies that rely on expert opinion, such as cross-impact analysis or trend-impact analysis. These results can be used in developing a comprehensive state forecast. Both cross and trend-impact analysis computer packages are available in the Florida Department of Education.

At this point the forecasting stage gives way to goal setting and policy analysis and implementation, for the future just doesn't happen, our actions help to shape it. Though a great deal of preparation and work go into adequate forecasting it remains, in essence, a passive state. It is our use of these forecasts in setting goals and implementing policies that is, in the societal sense, activity.

Stage III: Goal Setting for Florida

Up to this point a mechanism has been suggested for organizing, structuring and developing images of Florida's future. The premise underlying this stage is that planning for higher education requires that we have a feel for where the state as a whole is going. The goal setting stage requires, then, that we: (1) attempt to determine the social mileu within which higher education will function; (2) and determine a viable role for higher education in that mileu. Here, embodied in the policy-impact analysis approach, is the assumption that a number of formal and informal power loci within a state set the goals of higher education. As previously discussed, the key at this particular stage is inclusion of participants from all the concerned power loci in reviewing forecasts of possible futures and setting goals for higher education's place in the future.

Goals are measured states in which we want an organization to be, at or during a certain time period. Defined this way goals are more specific than broad objective or mission statements. In 1957 the Florida State Board of Education saw the state about to enter a period of unprecedented growth and development. That year they adopted the Community College Council's plan to provide post-high school educational opportunities within commuting distance of 99 percent of the state's population. Implementing this goal over the ensuing decade and a half required one of the larger sustained building efforts the state had seen, huge sums of capital outlay and a commitment of state resources on into the future. Certainly this example would suggest that goal setting should not be taken lightly and should be as broad based as possible.

Broad based involvement in setting goals for higher education has, in fact, been practiced in Florida. At several points over the last two decades "blue ribbon" commissions have been charged with gathering citizen input and setting goals for higher education in the state. In 1981 it would seem possible to build on the work of these past efforts and implement an ongoing planning and goal setting process with full citizen involvement and state-of-the-art forecasting and analytic techniques. The newly formed Florida Postsecondary Education Planning Commission (PEPC) provides the focus that such an ongoing planning and goal setting process should have. The forecasting and simulation capabilities available in the state would allow the PEPC staff to prepare comprehensive state forecasts and relate these to higher education goals and objectives.

An example of how this process might work can easily be imagined as one views the current and projected economic characteristics of South Florida. The Spanish speaking population in South Florida has grown tremendously in the last two decades. Over one third of the people in this region are Spanish speaking. As well, Miami and Tampa are becoming centers for banking and trade with Central and Latin America. The need for what is being called international education is becoming critical in this, the most populous part of the state. In other words, many South Floridians need a working knowledge of Spanish, and an understanding of Central and Latin American politics, geography, economics and culture to conduct their business successfully. Apart from interacting with Central and Latin American businessmen, providing services for foreign visitors has become big business in South Florida. The number of international visitors more than tripled during the 1970's and accounted for 2.1 million arrivals in 1980. In essence, the very character and orientation of the most populous, capital producing, and tax revenue producing part of the state is changing.

A comprehensive state forecast capturing the essence of this change might have profound programmatic implications for higher education. Academic areas have become so broad due to the explosion of knowledge that it is not uncommon to find an institutional department, with a limited number of faculty positions, holding a particular bias. One institution's psychology department may focus on counseling, another on testing learning theory paradigms using animal subjects. A forecast showing South Florida becoming an international center focused on Central and Latin America might suggest a bias for academic programs in this part of the state. Two of the state's major universities are not in South Florida, however. A demand might arise for international studies to be offered at these two institutions as well.

Funding for both universities and community colleges in Florida is tied to the number of student semester hours taken. If the international connection emerges as critical to the state's economic well being, it may become necessary to find a funding mechanism, not necessarily tied to enrollment, that assures excellence in those areas related to international studies.

In this scenario we see regional issues that could be critical to the state as a whole. If satisfactory solutions to problems such as this were not worked out by those responsible for the future of higher education, we can be sure that decisions would be made in the legislature. This example highlights the timely emergence of a focus for the ongoing planning and evaluation process provided by the Postsecondary Education Planning Commission. Using a comprehensive state forecast as the basis for a discussion of the environment in which higher education must function, PEPC could stimulate a state-wide dialogue on objectives and goals for higher education. Techniques such as cross-impact analysis could be used to discern where the goals selected and attributes of the forecasted state environment are parsimonious. A cross-impact analysis matrix might indicate that the goal of nine major universities with a full compliment of professional programs is incompatible with expected state revenues.

Focusing on phenomena such as the changing profile of South Florida, the higher education community together with concerned citizens might set as a goal the creation of centers of excellence in international law, linguistics, international studies, international economics, and business administration in South Florida institutions of higher education. A concomitant goal might be to create centers of excellence in other areas not related to international concerns but equally vital to the state's well being, such as agriculture or meteorology, in institutions in the northern part of the state. If programmatic goals such as these were set, a goal to develop a non-enrollment driven funding mechanism for programs essential to the state might be set as well. The utility of understanding constraints and opportunities prior to the legislative process is that a longer, more in depth discussion can be engaged. The legislature must act on all areas the state serves in a short period of time. In an increasingly complex society it is incumbent on those responsible for, and concerned with, a given area to discuss, compromise, and bring well reasoned goal statements to the legislative arena. The Postsecondary Education Planning Commission using the available exploratory and normative forecasting techniques would provide for the most creative and service maximizing goals to be developed.

Stage IV: Policy Analysis and Implementation

Policies guiding institutional activity are the means whereby goal states are reached. In developing policies to reach a given goal it is paramount that the ongoing and evolving nature of society be recognized. Policies do not guide us form one spot we are standing on to another. Rather, policies are used to bend the moving stream that is society and give it a new course. To follow the analogy further, when setting policy we usually work like beavers, one log at a time. Few of us, and few of our social structures, are endowed with earth moving equipment.

The initial task in this stage, as previously mentioned, is to identify those events which could have positive or negative effects on those trends or state of affairs related to the goals set. In the current example, setting permanent centers of excellence might require that new policies for program approval and review be adopted. The traditional, and usually gradual, method of building an excellent academic program might not suffice given the accelerating needs of the southern region of the state. Measures of program performance, other than publications and numbers of graduates, might be necessary at first. As well, policies governing the funding of programs might have to be changed. Currently, programs are funded on the basis of student semester hours generated. Somewhere in the equation of expanding enrollments, faculty maturing, grant reception and careful budgeting have come the funds for outstanding scholars. Creating, in a short time, an excellent program in international law, for example, would require a larger than usual allocation of funds. Policies governing such special allocations would have to be developed. Perhaps funding by student semester hours could be left behind altogether and some method for programmatic funding developed. It might also be expected that such decisions to support and develop programs would have to be made in an environment of static or decreasing revenues. In that case it might be necessary to develop policies to govern the reduction of programs deemed less essential.

In selecting and implementing policies most sensitive ground is crossed. It is at this point that people experience the effects of this policy development process. A progressive, inclusive, and democratic planning process is fine, as long as one's department is not reduced. Unnecessary and inadvertent negative effects might be avoided by generating policy-to-event impact matrices, but in the coming decade it is likely that parts of the higher education community will find events and policies unpleasant. Hopefully, the full policy-impact analysis process, including all those concerned, and using the best available techniques to assess environmental constraints and policy options, will provide for the least amount of negative circumstances.

Summary

It should be noted that the forecasting processes described here, particularly the probabilistic forecasting methods such as cross-impact analysis, have been employed only within the last decade or so, and have been used primarily in business and industry, with mixed results. The efficacy of these techniques is dependent upon the ability to (1) identify those events which may affect a trend directly or indirectly, (2) accurately assign subjective probabilities to those events, and (3) design and obtain a reliable and valid data base of social/educational indicators. The efficacy of the policy-impact analysis model is dependent, at this stage, upon the continued interaction of representatives of the various power loci within higher education.

However, given these requirements, conditions, and limitations, the policy-impact analysis model uses the technology available in contemporary social science in an approach which provides policy makers more reliable information about possible futures, and encourages the use of that information to achieve a more desirable future. Given the challenges facing higher education in the eighties, scholars and policy-makers in the higher education community are advised to explore this approach to formulating and planning and finance policy at the institutional, regional, and state levels.

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Planning, Control and Motivation Systems:
A Conceptual Framework

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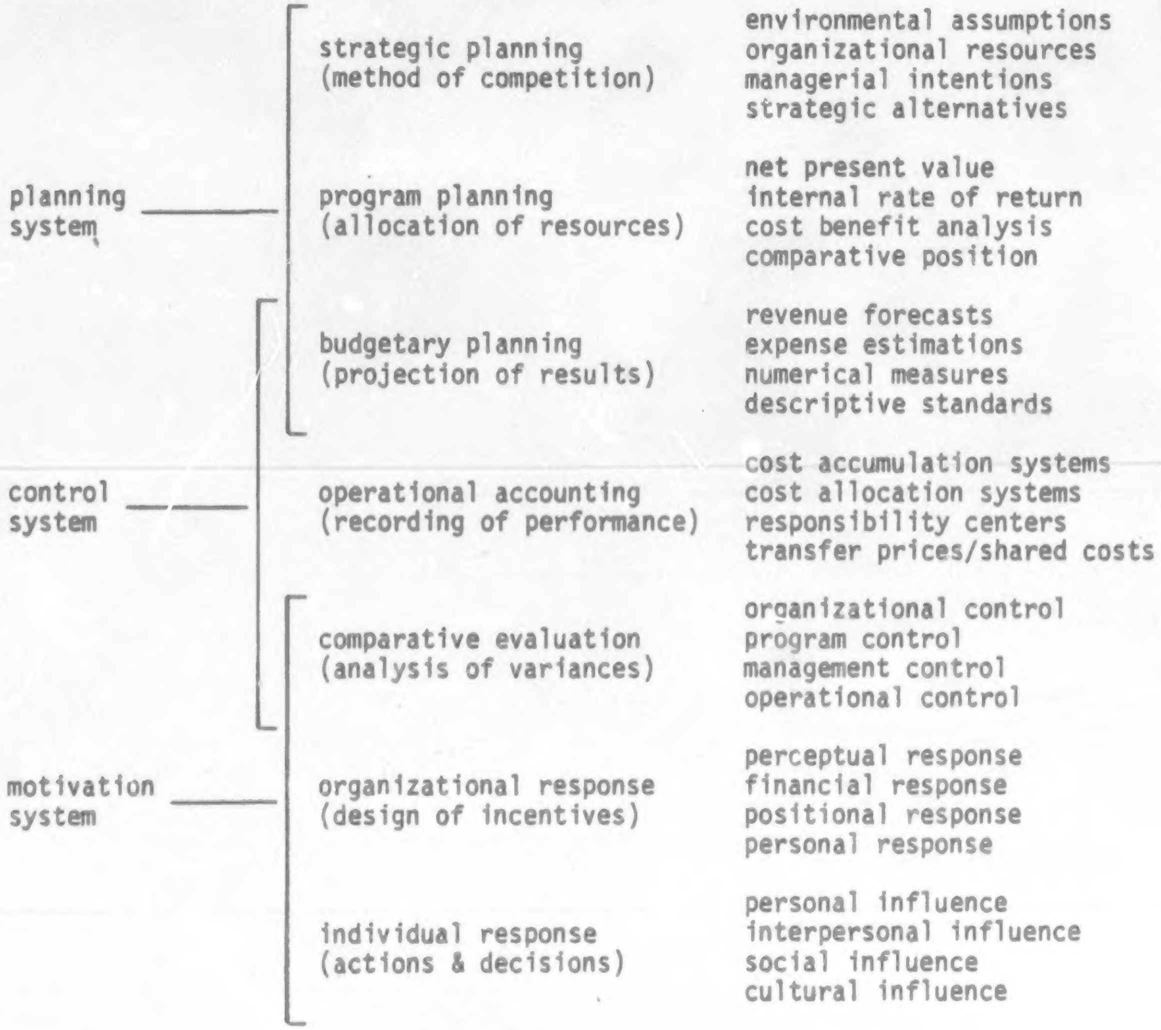
Planning, Control and Motivation Systems: A Conceptual Framework

Many colleges and universities, under the dual threats of funding constraints and enrollment declines, have started formal planning procedures. These procedures, however, have lost some of their financial effectiveness and much of their organizational support because the interrelationships between the different levels of planning, control and motivation have never been clearly defined. Planning, control and motivation within a productive organization are not separate entities, but overlapping systems:



	strategic planning (method of competition)	environmental assumptions organizational resources managerial intentions strategic alternatives
planning system	program planning (allocation of resources)	net present value internal rate of return cost benefit analysis comparative position
	budgetary planning (projection of results)	revenue forecasts expense estimations numerical measures descriptive standards
control system	operational accounting (recording of performance)	cost accumulation systems cost allocation systems responsibility centers transfer prices/shared costs
	comparative evaluation (analysis of variances)	organizational control program control management control operational control
motivation system	organizational response (design of incentives)	perceptual response financial response positional response personal response
	individual response (actions & decisions)	personal influence interpersonal influence social influence cultural influence

Colleges and universities do not need the stringent controls and financial incentives of business organizations, yet they do have to recognize that the evaluation of performance and the motivations of groups and individuals are both a natural consequence and an inherent problem in the planning process. Planning, control and motivation procedures must be consistent at all levels of an academic institution; the overlapping system framework will help to ensure that consistency. This paper will discuss each of the systems, and show the interrelationships or overlaps.

Planning has been defined as the process of anticipating the future consequences of current actions and decisions [1]. Planning involves consideration of the future, but it is not limited to forecasting approaching events or coming opportunities and problems; instead, it requires estimating the eventual outcome of a cause and effect chain stretching into the future, with interrelated causes and stochastic effects, where the relationships and probabilities are highly uncertain and sometimes even unknown. Planning of this nature is a complex innovative process that is directed towards producing a desirable future state for an organization. There are three levels of planning which, in a business firm, determine the product-market positions, the resource allocations and the revenue/expense projections; within an academic institution the levels remain the same, but the content changes to reflect the non-financial orientation. These levels are strategic planning, program planning and budgetary planning.

Strategic planning is the level of planning that is concerned with the design of the long-term method of competition for a business firm, or the long-term concept of service for a governmental, educational or medical organization [2]. The inputs into the strategic planning process are the environmental characteristics and trends which result in specific opportunities and risks, the organizational assets and skills which provide explicit strengths and weaknesses, the managerial/professional intentions which are the values and attitudes of the members of the organization, and the range of strategic alternatives open to the firm or service institution. The strategic decision, or the selection of the method of competition or concept of service to be followed by the organization, appears to be static; that is, to be made once, and then implemented by the structure and systems design. In reality, all of the input factors--the institutional performance, managerial/professional intentions, environmental characteristics and organizational resources--are continually changing, and the strategic decision must be continually reviewed and corrected. This continual review and, when needed, correction, requires a formal procedure, or system, to focus attention on these changes, and on the future opportunities and risks. In most organizations, material attention is focused on immediate problems, not future possibilities. The essential purpose of strategic planning is to consider the future, and prepare for it; numerous examples can be cited of business firms and service organizations that have failed to do this.

The formal procedures for strategic planning differ depending upon the size and diversity of the organization. A small company, with a single product or product line, needs only to establish a regular time for meetings of the president and functional managers, and a reporting system for economic conditions and industry trends. This group of executives, aided by common interests and complementary activities, can examine assumptions about the future, evaluate alternatives for the company, and establish plans for the products, markets and processes.

Strategic planning in a large company, with multiple product-market positions and product-process postures within a single industry, or across multiple industries, is much more complex than in a smaller firm, and has to be iterative, with continual recycling between the hierarchial levels of corporate executives, divisional managers and functional personnel. The planning process usually starts with environmental assumptions about the future, prepared by the corporate staff; all divisions should use the same base of economic, social and political data in their planning. Each division then provides a study of their current position and past performance within the industry, generally with data on industry sales, market percentages, company revenues, manufacturing costs, expected margins, divisional expenses, corporate allocations, capital charges and pre-tax profits. These figures are usually stated for the past five years, estimated for the current year, and anticipated for the next five years. The nine year span makes trends and changes very obvious. Information is also normally provided on the market shares of the major competitors in the industry, and the strengths/weaknesses of the division versus these leaders on such dimensions as product design, brand reputation, distribution coverage, promotional effectiveness, productive capacity, manufacturing costs, etc.; the intent is to support the sales forecasts and show the reasons for the profit trends. Ideally, different forecasts should be prepared comparing the expected results of alternative strategies, and the market assumptions and financial requirements of these other methods of competition. In a meeting between corporate executives and divisional managers, the alternatives are examined, a strategy is selected, the forecasts are considered, and the projections are eventually accepted or revised.

Strategic planning in non-profit organizations is considerably more complex. This complexity is due to the non-market pricing, external funding, professional personnel and multiple clientele that are usually associated with these service institutions. Again, however, it is necessary to start with consistent environmental assumptions about the future; all units within the institution have to use the same social and financial data in their planning. Each unit should then provide a study of their current position and past performance in comparison to other institutions offering approximately similar services to closely similar groups; non-profit institutions such as colleges and universities do not compete for profits within an industry of other companies, but they do contend for public approval and financial support within an "association" of other organizations, and strategic planning, in very simplified terms, can be considered an effort to position an organization within that association in order to gather that approval and support. The organizational units prepare the plans; the central administration reviews them; and then, in a series of meetings, the plans are modified in order to achieve an overall strategy or identifiable character for the institution.

Strategic planning in large companies was earlier thought to start with a statement of corporate objectives [3], usually in financial terms, and the divisional plans were expected to add up to meet those objectives. This directive planning forced the divisional managers to prepare forecasts based on corporate expectations, not industry conditions, and resulted in errors, mistakes and disasters. Directive planning can be successful in an expanding market since it creates a challenge which may be achievable; in a static or stagnant industry, it merely creates an illusion which may be fatal. The same situation occurs in non-profit institutions; organizational objectives stated prior to a study of actual assets and skills, environmental characteristics and trends, and managerial/professional values and attitudes, can easily lead to unachievable goals, not workable plans.

Program planning is the second step or stage in the planning - control - motivation sequence. A program can be thought of as a set of coordinated activities designed to improve the competitive position of a business firm, or to achieve the service posture of a non-profit organization. The introduction of a new product, the modernization of an existing plant, or the addition of a complementary service are all examples of programs. Programs tend to have a lengthy time span, multiple activities and extensive assets; they are large projects derived from the strategic plan of the organization, and they specify the personnel required and the resources needed to reach the competition position or service level defined by the selected strategy.

Program planning is used to specify the activities and to allocate the resources needed to achieve a given strategic position. The activities are usually described in very general terms, almost on the level of the number of people required to perform each of the functional and technical tasks; more specific definitions of these tasks are left to the budgetary planning stage where measures of performance are established and targets for achievement are negotiated on a short-term basis. Changes in the program and changes in the personnel permit short-term planning, often on a one-year cycle, for the activity specifications, but capital allocations have to be on a longer term basis. The financial inflows and outflows for each program or project, and the relative timing of those cash movements, must fit the overall capital sources and uses of the organization. Most active organizations have many more beneficial uses for capital than available sources, and are consequently continually short of cash, so the flow of funds has to be accurately estimated, and the use of those funds carefully planned. Program planning estimates the flow of funds over the life of each program or project, and then evaluates the relative desirability of these programs or projects. There are three formal methods for this evaluation:

1. Financial return. The financial reyurn models are based on the relative size and timing of the case inflows and outflows. Payback period and the accounting rate of return are the simplest of three comparative financial models; the payback period uses the summation of the annual profits after tax plus the depreciation from the project over the period of time needed to equal the initial investment as the ranking criteria, while the accounting rate of return uses the ratio of the average annual profits after tax plus the depreciation of the project to the initial investment. Both of these methods neglect the time value of money, and attach no importance to the timing of the cash flows.

   The net present value method of investment analysis uses the difference between the sum of the present value of the expected cash outflows and the sum of the present value of the expected cash inflows, both at a given discount rate, as the ranking criteria for programs. The internal rate of return method of investment analysis uses the discount rate that equates the present value of the expected cash outflows (investments) with the present value of the cash inflows (after-tax profits plus depreciation charges); in essence, the internal rate of return of a project is the discount rate at which the net present value is zero.

2. Cost benefit analysis. Cost benefit analysis is often used in non-profit institutions as a substitute for the capital budgeting procedures, or financial return models, used in business organizations. The financial return models for investment analysis assume that the positive cash flows are the benefits of the project, or can be used as surrogates for those benefits. In most non-profit or non-business

situations, the cash inflows may have very little relationship with the benefits of the project since the revenues are often not determined by either market pricing or full costing. Instead, revenues may be determined by the recipient's ability to pay, and the services are provided because they are felt to be needed, not because they are thought to be either cost effective or price elastic. The costs of a non-profit program can be measured by the cash outflows, or use of resources, but the benefits have to be gauged on some other measure than the cash inflows, and a financial equivalent for the services is often used. This financial equivalent is usually based on an estimate of social and individual benefits as, for example, in the incremental tax payments and income potential of a high school graduate versus a non-graduate over the person's life time, discounted back to present value, that are often used as the economic rationale for public education. The financial equivalents are subjective, and can be arbitrary, but cost-benefit analysis does provide a ranking criteria for the investment analysis of programs in the public sector.

3. Competitive position analysis. Both financial return models and cost-benefit techniques concentrate on the size and timing of cash flows, or on the cash equivalents for social and individual benefits, as the ranking criteria for programs developed to implement a selected strategy. A third ranking method, though much more difficult to quantify, centers on the competitive position or service level likely to be achieved by the program. The competitive position of a firm is difficult to measure, except in terms of market share, share growth or productive efficiency, and the attainment of a service level for a non-profit organization is even more troublesome to evaluate, but these are the primary determinants of long-term success for the respective organizations, and should be recognized in program or project evaluations. Discounted cash flow models, whether with actual or equivalent inflows, give primary emphasis to short-term results, due to the compounding of the discount rate over time, and ignore such essential results as pollution control, safety improvement or service expansion because of their lack of positive cash flows. Competitive position analysis will become more important, over time, than financial return models in the comparative evaluation of programs to implement a selected strategy.

Budgetary planning is the third step or stage in the planning - control - motivation sequence. Budgets are estimates of the revenues and expenses associated with each program or project developed to achieve the competitive position or service level envisaged in the selected strategy. Budgets really are programs expressed in terms of income and expenses; they detail and "fine tune" the programs. A budget also assigns responsibility for the activities contained in the program. This assignment of responsibility, probably, is the most important element in the definition of the concept: a budget is not so much a forecast of results as it is a commitment by members of a unit within an organization to achieve those results [4]. The distinction between a forecast and a commitment is essential in understanding the planning process, from strategy selection to resource allocation to budgetary responsibility. The budget brings members of the functional and technical units within each division of an organization to agree, in essence, to move partways towards reaching the competitive position proposed by the selected strategy. The overall planning process, and the differences between the three steps or stages, can be summarized in terms of the organizational level, the time horizon, and the conceptual output:

Planning Stage	Organizational Level	Time Horizon	Major Output of the Planning Stage
Strategic Planning	Corporate	5-10 yrs	Selection of the method of competition leading to a competitive advantage for the firm
Program Planning	Divisional	3-5 yrs	Allocation of the resources and plan of the activities needed to achieve the competitive position
Budgetary Planning	Unit	12 months	Commitment by members of the organization to achieve goals leading towards the competitive position

The time horizon for each stage is, obviously, an average or typical range, and is not meant to be an absolute requirement. The time horizon usually varies with the industry. Public utilities, with long time spans needed for regulatory approval and plant construction, generally perform strategic planning over 12 to 15 years, and program planning over 5 to 8 years. Colleges and universities might select 5 to 8 years for strategic planning, and 3 to 5 years for program projections to match the construction time for new facilities. Almost all budgetary planning, however, is on a 12 month cycle since the intent is to forecast revenues and expenses with reasonable accuracy, and to have the forecasts comparable to the financial records of the standard fiscal year for control purposes.

Budgetary planning combines forecasting the revenues and expenses associated with the various programs of a college or university, and setting goals and objectives for the departments and other academic units that are involved in those programs. The goals and objectives are the results that are expected; they are statements of where the departments and other academic units are expected to be at specific times in the future. These goals give members of all of the units the sense of direction and purpose that is necessary to coordinate their efforts, and they permit evaluation of the performance of the units. They serve, in short, as targets for achievement and as standards for control [5].

These "targets for achievement and standards for control" can be financial, non-financial or non-quantitative in nature. The financial measures are based upon anticipated revenues or expenses over a 12-month period, and give the appearance of precision and detail, but in reality revenues, costs and profits are summary figures for many diverse activities and are subject, of course, to the account-conventions. Even in business firms it is thought that financial standards define areas of responsibility, provide constraints on spending, and permit forecasts of cash flow, but that they do not accurately reflect short-term performance. Non-financial measures are needed to supplement the budgeted revenues, expenses and profits; many of these non-financial measures are also quantitative, and are based upon unit measures such as total enrollment, ratio measures such as students per faculty member, or percentage measures such as instructional costs compared to tuition revenue. These non-financial numerical standards can provide accurate measures of performance, but only for the organizational units where the output is clearly measurable on a single or composite scale, as in the basic courses with large enrollments where quality can be assumed and quantity can be measured. One definition of a college or university, however, is that they are places where quality counts. To evaluate quality, non-quantitative measures are needed. These non-quantitative measures, of course, are subjective, and thoroughly unsatisfactory, except in comparison to the more objective alternatives. Numerous proposals have been suggested, at my own university and I assume at others, to weigh publications by the reputation of the journal and the number of pages, but these always fall apart due to the recognition that the most advanced work can't be published in the most respected journals. Scholarly review, with all its faults (and they are many), remains the subjective standard for the evaluation of faculty research performance.

In summary, budgetary planning refers to the estimation of the revenues and expenses associated with each program or project developed to achieve the competitive position or service level envisaged in the selected strategy, and to the establishment of quantitative and non-quantitative measures of performance for the organizational units and individual members associated with the programs. The intent, in every instance, is to develop measures of organizational performance that will serve as targets for achievement and as standards for control. The development of valid measures of organizational performance through budgetary planning is difficult, but there are three generalizations that should be remembered.

1. Budgetary plans should tie back to the strategic plans for the long-term concept of service selected for the institution, and to the program plans for the allocation of resources and the definition of activities needed to achieve that level of service. Following the strategic, program and budgetary sequence of organizational planning, the annual budget should be seen as a consequence of prior planning, not as an independent exercise.

2. Budgetary plans should reflect the expected revenues and expenses of the programs, and should provide standards of performance for the organizational units and individual members that are responsible for the various activities within each program. Following the financial, numerical and subjective sequence of organizational standards, the annual budget should be seen as a commitment to measurable performance, not as a forecast of financial results.

3. Budgetary plans should be understood by the leader and other members of each organizational unit, and should be based upon known cost relationships or reasonable activity expectations. Following the input, process and output model of organizational performance, the annual budget should be seen as a realistic level of achievement, not as an arbitrary or unilateral assignment.

The process of establishing an annual budget that leads directly from the prior strategic plans and program plans of the organization, that reflects the expected revenues and expenses of the programs and provides valid standards of performance for the units, and that is understood and accepted by the managers and members of those organizational units, is difficult. To avoid the appearance of unilateral or arbitrary decisions on performance standards, and to avert the tendency to project revenues and expenses at last year's levels, it is common to recommend greater participation and reduced incrementalism in the budgetary process. There are problems with both recommendations:

1. Problems of increased participation. Budgetary planning is the annual process of forecasting revenues and expenses for the programs, and setting standards of performance for the organizational units, generally over a 12 month period. In forecasting these revenues and expenses, and setting these standards, it is often recommended that the managers of the organizational units responsible for the performance of program activities participate in the process to increase organizational commitment and individual motivation. Participation does generate commitment, and the recommended means of achieving participation is to develop the revenue and expense forecasts and the organizational performance standards through superior/subordinate negotiations. This process is termed "Management by Objectives"; the intent is that the subordinate responsible for the performance and the superior responsible for the review of that performance should together establish the scales of measurement and the expected levels of performance on those scales, prior to evaluation. It is believed that the process of negotiation, with a sequence of proposal, counterproposal, compromise and eventual agreement, will result in challenging but achievable national standards and control criteria. The concept is appealing, but the problem is that the annual budget is developed from the strategic plans setting the long-term competitive posture of the firm, and the program plans allocating the resources and defining the activities needed to achieve that competitive posture, and consequently many of the standards of performance for the organizational units can't be changed in participatory discussions, but have been assumed in the prior planning. It is, of course, possible to request changes in those prior plans, but that is often organizationally difficult. Participatory discussions on setting budgetary standards can easily lead to feelings of frustration and cynical distrust on the part of the subordinate, and to an apprehension of interpersonal incompetence on the part of the superior. Participative discussions for the purposes of mutual understanding of the prior plans, not for the purpose of establishing independent standards, probably are more productive in complex organizations.

2. Problems of reduced incrementalism. Incrementalism refers to the very common tendency, in preparing an annual budget, to adjust the prior year's figures to meet the current conditions, and not to base the budget on the organizational strategy and the program plans. Incrementalism starts with the concept that each organizational unit is "entitled to" an amount which, at the minimum, is the same as last year's, and which probably should be increased by an organization-wide percentage to reflect growing costs and greater inflation. Incremental budgets rely on the prior period as the frame of reference, rather than on the prior plans. "Zero-based budgeting" was developed to avoid incrementalism; this budgetary process identifies the activities within each organizational unit, and prepares alternatives for the activities. These alternatives may be different ways of performing the given

> activity, through a new technology, for example, or a more centralized department, or different levels of performance. Each alternative is then costed so that the superior, in the superior/subordinate discussions, can select an improved method of performance or a changed level of effort. The intent of zero-based budgeting is to force examination of the annual expense levels, and to analyze and justify each activity; the result is actually to place greater emphasis upon the participative discussions, because of the wide range of possible expenditures, and upon the interpersonal aspects of those discussions. Annual budgets in complex organizations should be based upon the strategic plans of an organization, and upon the program plans allocating the resources and defining the activities needed to implement the selected strategy, and not upon interpersonal negotiations.

The development of the annual budget completes the planning cycle or system, and starts the control cycle. Control is an awesome phrase in a university context, but properly used, it is the complement of planning. The term should refer to the process of comparing actual results with the expected outcomes of the three levels of planning, analyzing the variances, and instituting changes if needed. Control implies a set of standards, a comparison of performance against those standards on a repetitive or continual basis, and the possibility of corrective action when a deviation occurs. Feedback and correction are central to the concept of control; these elements are present in a physical system, such as the thermostat controlling a furnace, and should be present in a managerial system, as in the budget controlling expenditures, or in an academic system, with peer evaluation providing assistance in both instruction and research. Control of this nature is not primarily repressive, setting boundaries to action, or censurious, allocating blame for shortfalls, though both of these aspects are present in any control system; instead, it is a more positive process for deciding what should be changed now to achieve the future outcomes of the planning system. Control, in summary, provides the information needed to adjust organizational unit and individual member performance over the short-term to lead to an improved institutional position over the long-term.

Control is the complement of planning, and the two systems overlap: the control cycle makes use of the financial, numerical and subjective measures established in budgetary planning, and then records data from the development of each project and the operations of each unit in "operational accounting" and matches the actual vs. expected outcomes through "comparative evaluation."

Operational accounting is the fourth step or stage in the full planning - control - motivation sequence. As stated above, it follows budgetary planning, which in essence is the projection of results, and involves the recording of those results. The results may be financial, numerical or qualitative; the accounting process within an organization normally records only the financial data, but operational accounting is an expanded form to record both the financial and numerical outcomes of organizational activities, and to summarize the subjective evaluations. It is neither necessary nor possible, in this short note, to describe all three aspects of operational accounting, beyond making the obvious statement that the systems have to be computer-based for data accessibility and usage. This creates a problem at many academic institutions. Colleges and universities can be described in many slightly disrespectful ways, but one of the most accurate is that they are places where computers are studied, but not used. Or, more accurately, not used to their potential. Financial and numerical data can be classified, recorded, sorted and then combined in different patterns to portray the development of academic programs and the operation of academic units. The function of operational accounting is to ensure that this does happen, and that financial, numerical and descriptive measures are all used in the comparative evaluation of budgetary plans with actual operations to improve the performance of organizational units and to reward the efforts of individual members.

Comparative evaluation is the fifth step or stage in the planning - control - motivation sequence. It involves a comparison of planned versus actual results, through an analysis of the variances, and provides information to the leaders and members of the organizational units for the improvement of performance. Control is effective only when it helps the managers and members of organizational units; managerial assistance, not repressive standards or continual complaints, is the essence of control [6].

This assistance to the managers and members of the organizational units should be on three levels, corresponding to the three stages of planning. Planning, as described previously, can be divided into the three sequential steps or stages of strategic planning to select the long-term competitive position or service posture of the organization; program planning to allocate the resources and define the activities needed to achieve that competitive position or service posture; and budgetary to establish standards of performance of the organizational units responsible for performance activities. Control is needed at all three stages of planning to compare actual results with expected outcomes so that, when necessary, the current operations may be improved or the existing plans may be changed. It is common to concentrate this control effort on the activities of the operating managers since these organizational units generally have financial performance standards that make comparative evaluations easy, a short time frame that makes changed results apparent, and a low hierarchical position that makes corrective action possible. This emphasis upon the operating units, however, neglects the long-term viability of the selected strategy and the mid-term completion of the funded programs. Control is needed at all three levels of institutional strategy, program efficiency and operating effectiveness to improve the total performance of an organization:

1. Institutional control. Institutional control measures the viability of the selected strategy of the organization. The strategic plans, of course, define a long-term method of competition or concept of service, and the institutional controls should evaluate progress towards achieving that competition position or service level. It is certainly difficult both to identify the desired position and to measure progress towards achieving that position in financial or quantitative terms, but some of the dimensions might be enrollment trends, scholarly writings, faculty opinions, alumni gifts, funding levels, external reviews and a general spirit of accomplishment. That latter element, the general spirit of accomplishment, can't be measured, but we all know when it is there. The president and vice presidents of a university are responsible for positioning that institution within an association of other institutions, with the intent of achieving a long-term comparative advantage that will lead to public approval and financial support. Institutional control should evaluate that strategic decision by comparing expected results with actual outcomes on numerous financial, numerical and descriptive dimensions. Important variances should result

in changes in the strategic plans, in the resource allocations and operating activities that were designed to implement those plans, or in the senior management. It is necessary to create an atmosphere of accepting environmental and organizational changes, and of recognizing the need to plan for those changes, within the senior management of most organizations; a control system that revealed inattention to those requirements, and a motivation system that penalized that inattention, would help greatly in developing the needed attitudes and abilities.

2. Program control. Program control measures the execution of the programs designed to achieve the long-term service posture of the institutional strategy. Program planning, as described previously, estimates the flow of funds over the life of each program or project, and specifies the activities needed to complete that program or project. Program control compares the estimated usage of funds with the actual expenditures, and particularly compares the planned activities with the actual achievements. Most programs consist of a number of activities or tasks that are interrelated by time; many of the tasks cannot be started until others are completed, so that delay in one activity creates additional delays, and additional costs, in others. Program control systems usually recognize these interrelationships, either through simple comparisons of the estimated versus actual completion dates for each activity, or with formal network models such as PERT and CPM that explain changes in the time and cost requirements. Major variances in resource usage or completion dates should be analyzed for the causes, and should result in program changes, activity changes or management changes. Again, it is necessary, even within a university, to develop a tradition of completing programs and projects on time and to cost estimates amongst the managers or leaders of those programs; a control system that not only reveals the deficiencies but helps to correct those deficiencies would assist in developing the needed attitudes and abilities.

3. Operating control. Operating control measures the performance of the organizational units that are responsible for the academic and technical activities within each program. Budgetary planning, as described previously, estimates the revenues and expenses associated with each program, usually on an annual basis, and sets the goals and objectives for the academic and technical units involved in those programs. These goals and objectives are the results that are expected; they are statements of where the organizational units are expected to be at specific times in the future. The goals and objectives may be financial, reflecting the anticipated revenues and expenses; or numerical, showing unit, ratio or percentage measures of performance; or descriptive, with qualitative and subjective standards. Operating control, as used here, refers to the comparison of planned results to actual outcomes for all three types of standards. Major variances in performance should be analyzed, and could result in changes in the budgetary plans, in the managerial activities, or in the unit personnel. It should be remembered, however, that the purpose of the operating control system is to provide information for the leaders and members of the organizational units that will eventually lead to improvements in performance; assistance to the members, not evidence of incompetence or inability, is the objective of control, and that assistance should lead

to changes in the plans or in the activities more readily than to changes in the personnel.

Changes in operating personnel are common in business; that is due, at least partially, to the failure at this level of control to separate the evaluation of the organizational unit, as an economic entity, from the evaluation of the manager and members of that unit as individual persons. It is necessary in the analysis of variances at all levels of control to understand that some of the factors in the performance of an organizational unit are subject to the direction of the manager and the efforts of the members, and some are not. The factors not subject to the direction of the manager and efforts of the members usually include problems outside the organization, such as changes in the economic cycle of the country or the competitive structure of the industry, and problems outside the unit, such as changes in cooperative efforts or operating results by other units. For the evaluation of personal performance, rather than the measurement of organizational achievement, it is important to recognize that some factors can be foreseen in the planning stage, that some can be managed in the control stage, and that some can be neither foreseen nor managed. Accurate identification of these classes of problems is important in business firms, and crucial in academic institutions, for they impact the design of the motivation system to provide rewards and sanctions at all levels of the organization.

Motivation is the complement of control; it is the process of rewarding the individual or unit whose performance has brought actual results close to the planned outcomes. Motivation attempts to create conditions such that members of an organization can fulfill their own needs, which often differ on numerous dimensions, by meeting the organizational standards. Goal congruity is central to the motivational concept; each individual has needs which should be recognized and expectations which should be understood, and each organization has standards which must be met. Motivation of this nature can be either positive or negative, with both rewards and sanctions, but the incentives have to be tied to the anticipated outcomes of the planning process, to the comparative evaluations of the control system, and to the needs and expectations of the organizational members. Institutional motivation, in summary, rewards or punishes individual and divisional performance over the short term in order to lead towards an improved organizational position in the long-term; it consists of an "organizational response" and an "individual reaction."

The organizational response is the sixth step or stage in the planning - control - motivation sequence. Organizational response refers generally to the reaction of an organization to unit or individual performance as measured by the comparative evaluations of the control system, and specifically to the design of incentives to reward that performance. A planning system becomes a control system when organizational units and individual members are evaluated on the variances between planned results and actual outcomes, and a control system becomes a motivation system when the performance levels of both organizational units and individual members are recognized and rewarded. Recognition is fully as important as reward; both are included in the concept of an organizational response, which may be of four types:

1. Perceptual. A perceptual response is the recognition of achievement of either an organizational unit or individual member by the balance of the organization. Recognition of achievement, with that achievement measured by the comparative evaluation of planned versus actual

performance, is apparently the simplest, certainly the least expensive, but unfortunately one of the more uncommon of all organizational responses. Members of an organization like to believe that their contributions to the organization are perceived and acknowledged by others; this acknowledgement, however, has to be more informal than formal, and more unforced than directed. Organizational newsletters and congratulatory meetings don't work; the respect of co-workers and comments of peer individuals do, but it is impossible to design the latter as part of a motivation system. The perceptual response of an organization is complex, and largely unmanageable, but critical in the motivation of the leaders and members of an academic institution.

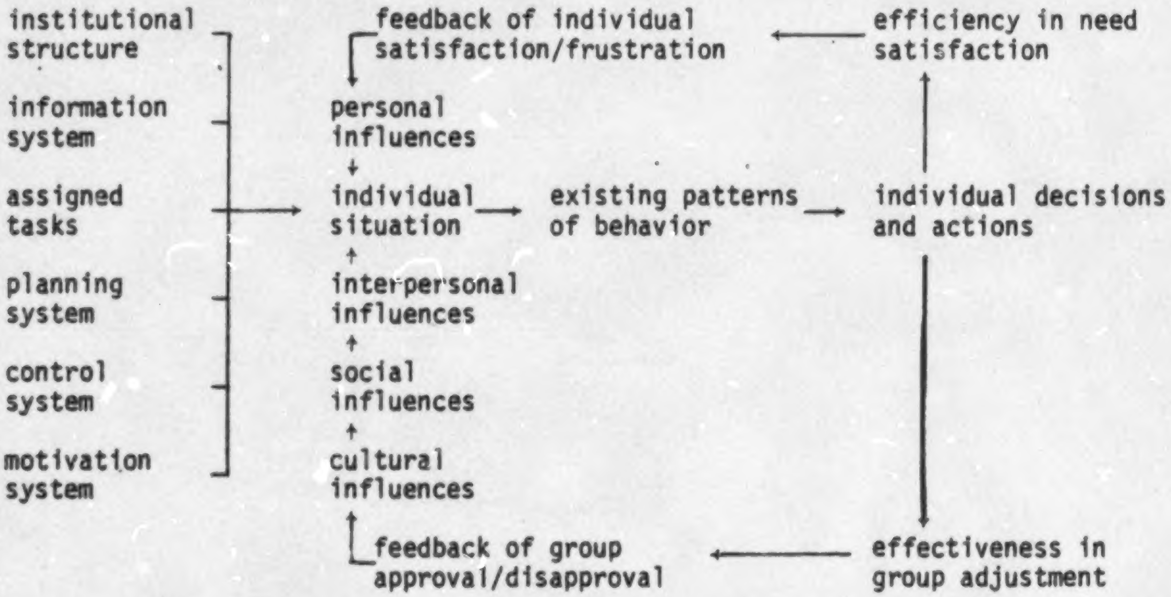
2. Financial. A financial response is the payment of a monetary reward for individual achievement, again with that achievement measured by the comparative evaluation of planned versus actual performance. The monetary rewards in business firms are normally tied to the budgetary measures of performance, with a commission paid on sales or a bonus awarded for profits. It is essential that the measures of performance used to compute the monetary rewards be considered carefully, for most of the single financial standards can be manipulated: sales may be recorded in the wrong period, or profits can be increased by a cut in the developmental expenses. In an academic institution it is traditional that financial incentives be limited to salary increases, and the effectiveness of salary increases has been limited recently by strong pressures for "across-the-board" raises. This is probably unfortunate because financial rewards can be effective; they provide both increased income for the individual and a form of perceptual response by the organization. Comparative incomes represent one means of acknowledging the relative contributions of both organizational units and individual members to an academic institution.

3. Positional. A positional resonse is the promotion of a person for individual achievement. The positional resopnse is only partially effective in business firms since normally there is a considerable time delay between the recording and evaluation of performance and the announcement of the promotion, but as with the monetary reward, a positional change is a form of perceptual response, and indicates recognition of the contributions of that person to the organization. Promotion and tenure, of course, are the traditional forms of motivation at colleges and universities; they have the advantage of combining perceptual, financial and positional incentives at an academic institution.

4. Personal. Personal responses are the non-financial and non-positional responses by an organization; they include the office locations, decor distinctions, parking privileges and club memberships that indicate status within the organization and that, together with football seat locations, are not entirely unknown within colleges and universities.

The financial, positional and personal incentives of an organization should, obviously, be designed to reinforce the performance measures and comparative evaluations of the control system, and to supplement the perceptual response that is crucial in motivation. The effort and commitment of various individuals within an organization will differ, however, even if evaluated with similar standards and rewarded with the same incentives. This variety of response is due to personal differences between individuals, and even within the same individual at different times, and results in an individualized reaction to the planning, control and motivation systems.

The individual reaction is the seventh, and last, stage in the planning - control - motivation sequence. Individuals react differently to formal incentives, even in closely similar situations with nearly identical organizational influences; this is because individuals are truly different. People differ in physical abilities, mental capacities, interpersonal skills, social expectations, cultural beliefs, educational levels, past experiences, current conditions and future needs; within a university, all of these influences are present, plus the differences in disciplinary orientation, which can be major. The large number of dimensions that can be used to describe personal differences makes it nearly impossible to forecast individual reactions to the motivational systems within an organization, but it is possible to identify many of the forces that influence individual decisions and actions, and it is possible to predict typical or "average" behavior. These forces, and the relationships amongst them, can be shown graphically [7]:

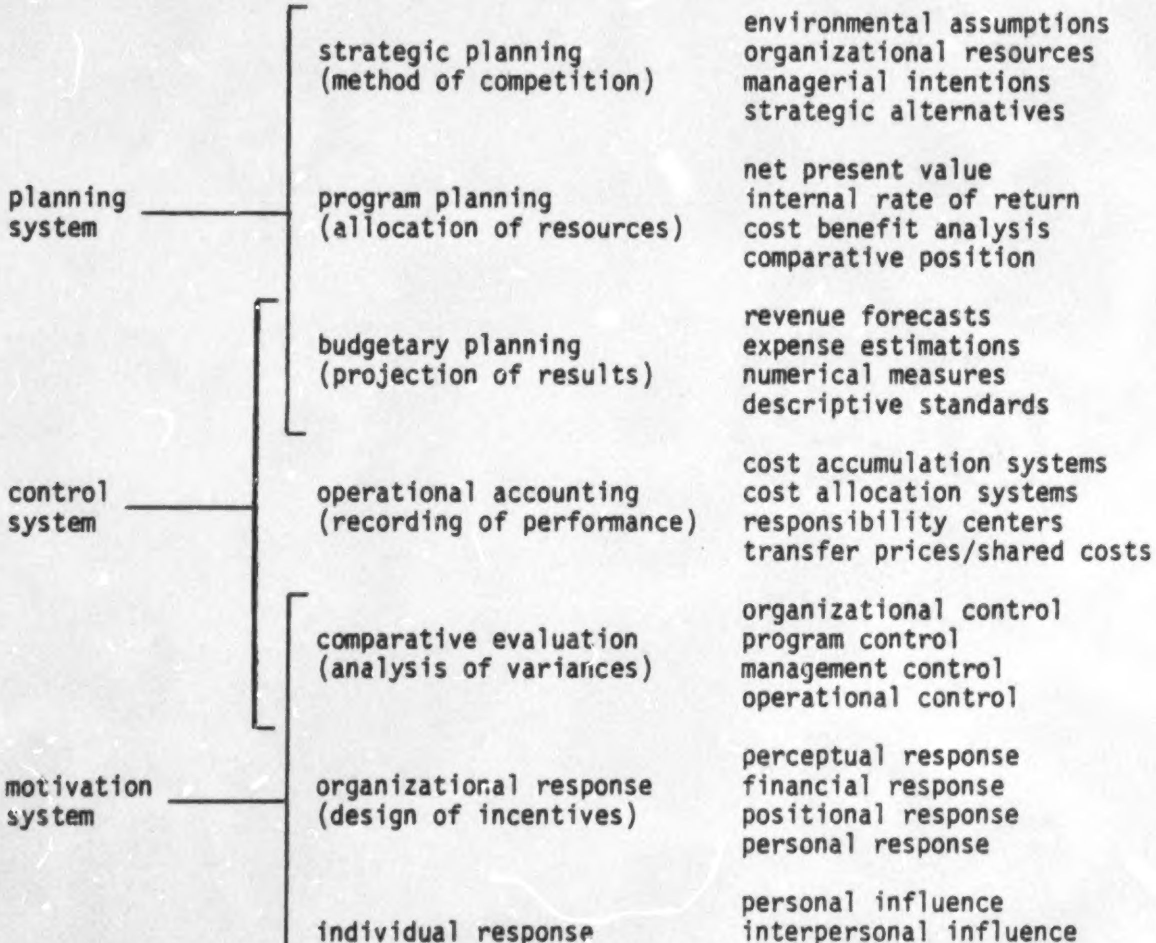

institutional structure
information system
assigned tasks
planning system
control system
motivation system
feedback of individual satisfaction/frustration
personal influences
individual situation
interpersonal influences
social influences
cultural influences
feedback of group approval/disapproval
existing patterns of behavior
individual decisions and actions
efficiency in need satisfaction
effectiveness in group adjustment

The organizational forces which influence individual decisions and actions are the institutional structure, information system, assigned tasks, planning system, control system and motivation system. The institutional structure creates a position for the individual relative to others within the organization; the information system provides a portion of the data needed to perform the assigned tasks; and the planning, control and motivation systems together generate the performance measures, the comparative evaluations, and the financial, positional and personal incentives. These organizational forces, however, do not determine behavior; they merely influence it, and their influence may be minor in comparison to the personal, interpersonal, social and cultural factors. These factors cannot be defined in a short paper on academic systems, but they are certainly understood at all academic institutions.

Each individual within an organization has an existing pattern of behavior that is based upon personal cognition and motivation, interpersonal attitudes and traits, social roles and status, and cultural norms and values. That pattern of behavior is influenced partially by individual needs for personal (food, shelter and clothing), interpersonal (friendship), social (esteem) and cultural (self-development) benefits; and partially by the organizational forces that come from the institutional structure and planning, control and motivational systems. Behavior in organizations is complex, not simple; for the person concerned with the design of a motivational system, the essential concept is the recognition that formal incentives may have a very limited influence on individual decisions and actions.

Individual decisions and actions within an organization are guided, not directed, by the combined impact of the institutional structure and the managerial systems for planning, control and motivation. These systems, to be effective, must be consistent. The planning procedures at many colleges and universities have lost much of their financial effectiveness and organizational support because this need for consistency has not been recognized.

Consistency is key, and it is emphasized here by repeating again the graphic display of the relationships between the stages of the planning - control - motivation sequence that must be understood for the managerial systems to be effective:



	strategic planning (method of competition)	environmental assumptions organizational resources managerial intentions strategic alternatives
planning system	program planning (allocation of resources)	net present value internal rate of return cost benefit analysis comparative position
	budgetary planning (projection of results)	revenue forecasts expense estimations numerical measures descriptive standards
control system	operational accounting (recording of performance)	cost accumulation systems cost allocation systems responsibility centers transfer prices/shared costs
	comparative evaluation (analysis of variances)	organizational control program control management control operational control
motivation system	organizational response (design of incentives)	perceptual response financial response positional response personal response
	individual response (actions & decisions)	personal influence interpersonal influence social influence cultural influence

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Strategic Planning in the Small, Private, Liberal Arts College

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Strategic Planning in the Small, Private, Liberal Arts College

In textbooks and survey articles on strategic planning, one often encounters statements such as: "...little has been done to answer questions (concerning strategic planning)...for non-business organizations." (Hofer, 1976, p. 261) Accordingly, one might expect a paucity of literature on the subject of planning in the college or university context.

Even a casual examination of the literature indicates that there is no dearth of writings on college planning. Wortman (1979) observed that, among the not-for-profit institutions, higher education has probably been discussed more extensively than others. One survey writer counted over a thousand citations in some way relevant to strategic planning for colleges. A more probing inquiry, however, may very well verify the opinion that, volume of literature notwithstanding, there is not much of substance to be found.

The literature on strategic planning for institutions of higher education is overwhelmingly prescriptive in nature, and its prescriptions urge the adoption of a planning structure model that is virtually identical to that developed for and employed by profit- and growth-oriented industry. This adaptation of the industrial planning model can be seen in the comparison in Table I of two planning schemes, one exemplary of the college planning literature (Bergquist and Shoemaker, 1976, pp. 3-4) and the other from the industrial planning field (Learned, Christiansen, Andrews, and Guth, 1965).

In addition to the widespread acceptance of this basic model of the structure of planning, several other concepts are stressed in the prescriptive literature. For example, extensive participation in the planning process is commonly advocated. How this participation is to be achieved, however, varies from author to author. A frequent device for participative purposes is that of the planning team or committee. Recommended membership on the committee varies, but most frequently includes administrators, faculty, and students, and somewhat less frequently, trustees, alumni, and local community representatives. That the small committee approach satisfies the broad participation rubric is, of course, debatable.

This literature almost always recommends that a planning officer be designated, responsible to the president and for the coordination of the activities of the planning committees or organizations. The role of the chief executive is not well clarified by this literature. Some articles suggest an extensive role, others only a peripheral one. Most of the planning prescriptions urge careful consideration of environmental influences on the planning process and on the institution, particularly as these constitute a data base (e.g., demographic, economic, social trends, etc.) and in the determination of the institution's socio-economic purpose or mission. Several of the published "guides" or "manuals" on college planning include explicit timetables for the planning cycle within the academic year, forms to be filled out concerning such items as departmental budget requests and resource appraisals, charts for information and documentation flows, and organization charts. Indeed, a few of these manuals are offered as complete, ready-to-install, procedures packages.

Table I Comparative Models of the Structure of Strategic Planning

Bergquist and Shoemaker Model of College and University Planning	Learned, Christiansen, Andrews, and Guth Model of Corporate Planning
1. Assessing the current, past, and future states of the institutions and its environment.	1. Identification of the opportunities and risks in the environment.
2. Clarifying institutional mission and goals.	2. Identification of the resources, weaknesses, and strengths of the organization.
3. Developing an analytic and projective model of the institution.	3. Identification of the personal values and aspirations of the participants in the organization.
4. Designing and testing strategies for institutional stabilization and change.	4. Identification of the legitimate interests of other segments of society to which the organization is responsive.
5. Implementing strategies for institutional stabilization and change.	5. Reconciliation of the environmental influences, the strengths and weaknesses within the organization, the values and aspirations of the participants, and the obligations to society.
6. Monitoring of effects and possible redesign of the analytic model and the implemented activities.	6. Identification of the tasks necessary for the accomplishment of its purpose and the deployment of organizational resources to these tasks.
	7. Provision of a suitable organization structure for the accomplishment of these tasks.
	8. Provision for a set of measurement and control systems pertinent to the accomplishment of these tasks.

Broadly then, this prescriptive literature has accepted and adopted many of the features of industrial planning. But this acceptance has been generally with little or no proof of its applicability. It assumes a suitable analogy between business and institutions of higher education. But the aptness of this analogy must be questioned. Indeed, Baldridge, a major writer in the field of academic governance (1978), challenges the general applicability of industrial methods to academic administration. He warns that:

> ...the organizational characteristics of academic institutions are so different from other institutions that traditional management theories do not apply to them. Their goals are more ambiguous and diverse. They serve clients instead of processing materials. Their key employees are highly professionalized. They have unclear technologies based more on professional skills than on standard operating procedures. They have "fluid participation" with amateur decision makers who wander in and out of the decision process.
>
> As a result, traditional management theories cannot be applied to educational institutions without carefully considering whether they will work well in that unique academic setting. Some traditional theories, particularly in the decision-making area, apply well to academic settings; others fail miserably. We therefore must be extremely careful about attempts to manage or improve higher education with "modern management" techniques borrowed from business, for example. Such borrowing may make sense, but it must be approached very carefully. (p. 9)

In another study of academic governance, Cohen and March (1974) say that college planning "can often be more effective as an interpretation of past decisions than as a program of future ones." (p. 228) Thus, in their view, it would seem that planning is a rationalization or apology for where the institution has been, rather than where it is going. This is hardly consistent with the concepts and practices of industrial planning.

While the bulk of the literature on planning in the college context is *prescriptive* in nature and prescribes the application of industrial planning models, there have been only a few *descriptive* studies which have examined actual practices in college and university planning, and which have begun to develop the needed proof that industrial planning concepts are applicable. One such observer, Freeman (1977a) has complained that there is "little theoretical underpinning for comprehensive (educational) planning...(and)...the development of a general theory to guide comprehensive planning is some distance away..." (p. 33) Freeman investigated the planning practices employed by the 56 largest research universities in the United States (1977b). Essentially, his study confirms that while interest in comprehensive planning is growing, its practice has only just begun. Furthermore, the study showed that such planning is highly centralized, highly structured, somewhat dominated by input (resource) considerations (as opposed to output or educational objectives), and generally built upon loose conceptual foundations.

Another exception to this lack of research support for the applicability of the industrial planning structure model can be found in the research conducted by Hosmer (1972). He tested the industrial structure model by examining the strategies developed and implemented in the formation of three new graduate schools of business administration. Broadly, he concluded that the concepts of industrial strategy were applicable to educational planning.

While Hosmer's research is a valuable step towards supporting the applicability of the industrial planning models, it must be noted that he worked with graduate schools of business and with administrators well versed in or inculcated with the industrial model. But the prescriptive literature for college planning does not limit itself to planning for business schools or to application by administrators trained in or even aware of industrial management techniques. Further evidence is therefore needed, and one of the objectives of this present research is to test the suitability of the industrial planning models in another sector of higher education, one which is far less likely to be as predisposed to industrial methods. We shall return to this point later in this paper.

Not only does the prescriptive literature urge the adoption of the concepts of the structure of industrial planning, it almost never departs from the recommendation of a single planning mode or process, one that is formal, rational, and highly structured. This prescribed comprehensive-rational approach to strategy-making draws its conceptual foundations from classical microeconomic theory, i.e., the decision-maker considers the entire range of alternatives and their consequences and chooses that alternative that maximizes some measure of utility. This approach has been called the "synoptic" method (e.g., Braybrooke and Lindblom, 1963, p. 40), a term which will be used here for convenience. But while the college planning literature largely confines itself to prescribing the "synoptic" process, a large and growing body of industrial theory and literature goes much farther in its examination and endorsement of alternative methods.

Modifications in the prescribed planning process for industrial firms are based on a variety of differing conditions arising from environmental pressures, economic imperatives, size, product mix, and organizational climate factors. For example, Mintzberg (1973) argues that at least three different modes of planning are to be found and are appropriate for the planning needs of differing organizations. The three modes he suggests are the entrepreneurial, the adaptive, and the planning mode. Essentially, the entrepreneurial mode is a proactive, opportunistic, top-down process aimed at growth, and suitable for the small organization with strong leadership. The adaptive mode is more reactive and survival-oriented, aimed at incremental change, and suitable for the established firm in a complex environment. The planning mode is more participative, rational, analytical, and formal, aimed at both growth and efficiency, and suitable for the larger firm in a more predictable and stable environment.

Mintzberg hastens to point out that the organization need not adhere to any one mode of planning. It could, and indeed should, employ combinations of modes subject to the exigencies of the decisions to be made, the personalities of the participants, and the realities of the situation. He distinguishes planning from strategy-making, in that planning has come to be identified with the operation of the formal, rational models abundant in the literature (including the college planning literature) which he labels the "planning" model, while it is the making of strategy that is the true management task, however it may be done.

While the college planning literature, in its espousal of the synoptic model, denies or ignores the relevance of other influences on or methods of decision-making, such as political or organizational factors or models, research into decision- and policy-making in industry and government has not been so narrowly constrained. The role of organizational politics, for example, is attracting increasing attention. That it plays a legitimate role in decision-making is the subject of a growing body of theory and inquiry. But the college planning literature deals with institutional politics in only a cursory fashion. For example:

> Many of the factors that can hinder effective planning such as departmental rivalries, bureaucratic inertia, and intellectual snobbery, are not considered...except in passing...Successful planning resolves these inevitable conflicts not on the basis of institutional politics but rather on the degree to which proposed programs conform to institutional goals. (Kieft, Armijo, and Bucklew, 1978, p. 2)

On the other hand, a major thrust of Baldridge's work is that the campus is a political milieu, and that political process models are usually more apt descriptions of academic governance than are others (1971, 1972).

Bergquist and Shoemaker, cited earlier for their planning model in the college planning literature (Table I), support the need for the synoptic approach to planning with the statement: "Many...planning efforts fail...because they consist of a strategy of 'disjointed incrementalism'..." (p. 2) They urge a systemic approach, with emphasis on extensive institutional data, consideration of secondary or unexpected consequences to decisions, and concern for the long-term effects of seemingly desirable short-term changes. Their criticism of "disjointed incrementalism" appears to be oblivious to the increasing interest in incrementalism as a legitimate and effective approach to organizational strategic change.

The incremental approach has received extensive examination by Lindblom (1959, 1979, and with Braybrooke, 1963) and most recently by Quinn (1977, 1978, 1980). Quinn calls it "logical" incrementalism, avoiding the pejorative implications of "disjointed" and showing that it is indeed a logical or rational method in its own right. In empirical studies of actual corporate practice, he shows it to be not only popular, but conscious, proactive, and purposeful, and an excellent way to combine the contributions of the synoptic method with political and organizational process models. Quinn defines incrementalism in terms of the planning activities of sub-systems within a larger organizational context, particularly when those sub-systems plan their strategy with full consideration of goals, resources, evaluation, and the other aspects of planning structure, described in Table I earlier. He cautions against "piecemeal" planning by urging that the sub-systems carefully consider the integration of their programs with those of other sub-systems and the entire organization (1980, p. 135).

In summary, while the college planning literature is rigid in its prescriptions of the adoption of industrial planning methods and the use of the synoptic approach to planning process, the literature on industrial planning has moved towards the recognition and acceptance of multiple modes and models of strategy making. Indeed, some of the decision models or influences specifically condemned by the college planning literature, notably the role of institutional politics and the incremental process, are shown in the industrial literature to be not only popular but often appropriate. It is plainly evident that more research, particularly empirical research, is needed on the process of planning for institutions of higher education.

The Research Problems

Earlier in this paper, a typical planning structure model from the college literature was shown and compared with one from the industrial literature (see Table I). The essentials of both of those models can be combined and put into the context of college planning. Figure 1 depicts this schematically.

Note that this structure model is presented as an interrelated system with each element simultaneously dependent upon and a determinant of every other element. For example, strategic choices are made in order to achieve institutional expectations, which are themselves largely influenced by the range of strategic alternatives available to the institution.

Furthermore, this structure model is offered as a universal model, applicable under any and all circumstances. No provision is made for the alteration of the model under certain conditions. This means that the selection of strategic alternatives to be implemented must always be consistent with institutional expectations, or that implementation must always include a measurement and control system that relates performance to objectives.

This, then, is the model that is heavily prescribed for use by college and university planners. But the prescriptive literature provides little or no evidence that such a model is indeed appropriate for college use, or that it only operates when "formal" planning systems are employed.

One exception to this lack of research support for the applicability of this planning structure model has already been noted in the work of Hosmer (1972). But, as also noted, Hosmer studied the planning conducted by graduate schools of business. Further evidence is needed that this model applies to other types of institutions of higher education. The small, private, liberal arts colleges, for example, would be a type of institution suitable for further research. The liberal arts colleges tend to see themselves as quite different from profit-oriented industry, and if one were to demonstrate support for the industrial planning models in this sector, it would--along with Hosmer's study--show support at both ends of a broad spectrum of institutional types.

Therefore, the research questions examined by this research were:

1. Are the concepts of industrial strategic planning also applicable to small college planning?

2. Does application of these concepts require a formal, highly organized, continuously functioning planning system?

3. Under what circumstances are college planners most apt to practice comprehensive or synoptic planning, and under what circumstances are they apt to deviate towards incomplete or non-synoptic processes?

4. What is the nature of these deviations?

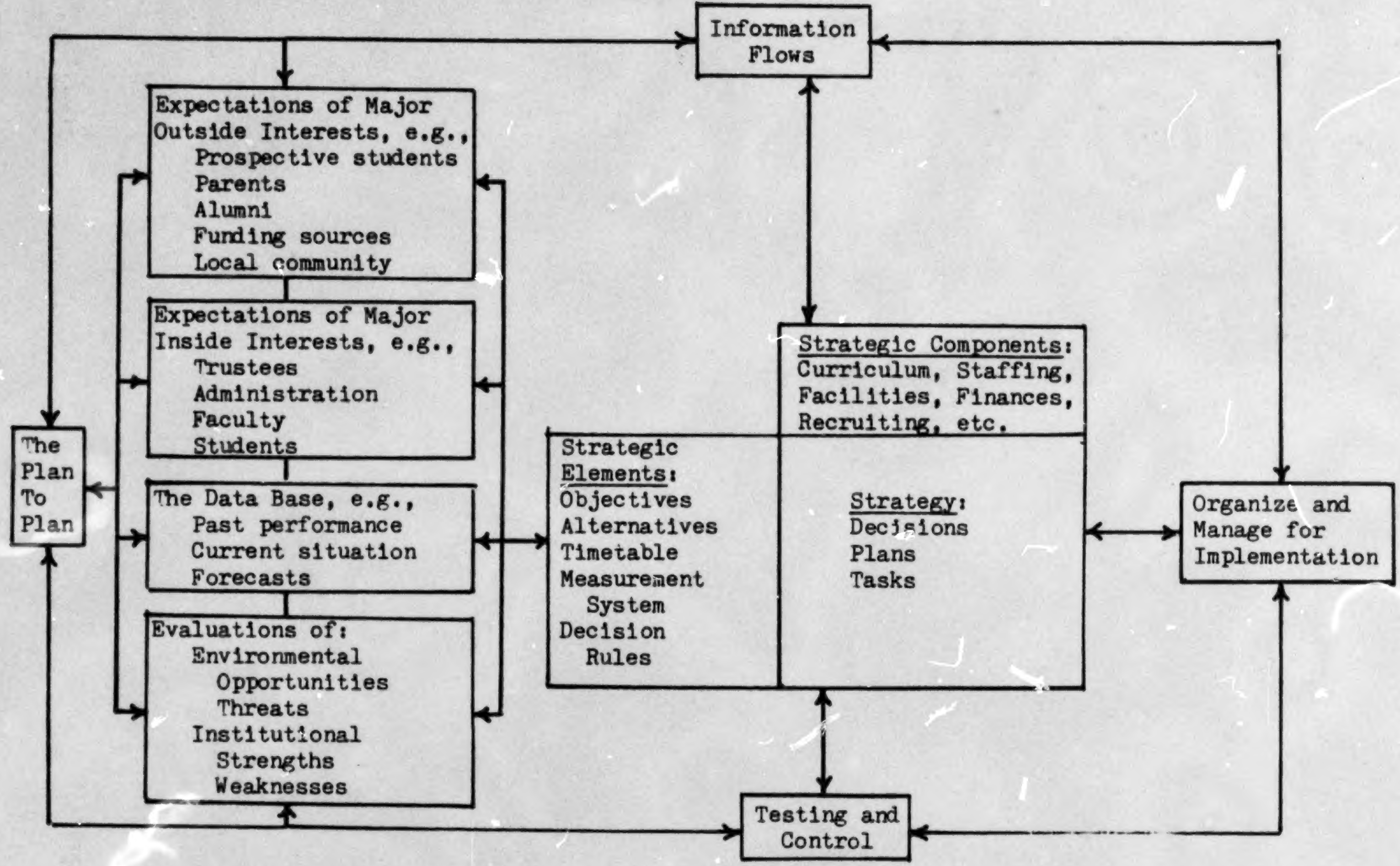

Figure 1. The Structure of Strategic Planning (adapted from Steiner and Miner, 1977, p. 18)

In order to find answers for these questions, it was decided to examine in detail the planning procedures and processes employed by a sample of selected, small, private, liberal arts colleges. For this purpose, the case-description-and-analysis method was chosen. Two types of cases were used: cases developed by our own field investigation, and cases available in the literature.

The choice of the case method involves a trade-off between depth and breadth of analysis. The case method permits a thorough and rich description of the planning process actually employed, but time and expense limit it to a relatively small number of subjects. Hypothesis testing by statistical techniques is therefore not feasible due to the small sample size. A larger sample could be studied by means of less costly mailed questionnaires, but it is felt that the kind of information we are seeking is not likely to be elicited effectively by questionnaires. It is reasonable to expect that respondents to questionnaires concerning the procedures actually employed in making strategic decisions may tend to bias their responses towards the synoptic, since that method is the one that is both heavily prescribed and consistent with classical decision-making theory. (Recent articles by Van Maanen, 1979, and Piore, 1979, discuss the phenomenon of questionnaire and interview subjects giving false answers to questions concerning their administrative behavior.) The case method of analysis, however, does permit the thorough study of actual strategic decision incidents, and what it lacks in statistical precision is more than made up in the richness of description that is so lacking in the existing literature on college planning.

Three case descriptions were thus developed. In addition, nine other usable cases were found in the literature. Useful cases are difficult to find in the literature for at least two reasons: (a) the published cases were not written with our research design in mind and may omit information appropriate to that design, and (b) aside from the cases distributed by the Intercollegiate Case Clearing House, published cases are usually written by representatives of the subject colleges and generally describe how those institutions have successfully installed comprehensive, i.e., synoptic, planning systems. These latter cases are usually employed by those who write prescriptively about college planning to verify their prescriptions. We must assume, of course, that the descriptions are accurate, but we cannot be sure that the case writers have been entirely objective or candid.

Thus, twelve institutions were examined: Clark University, Washington and Jefferson, Juniata, Waynesburg, Villa Maria, St. Benedict, Spring Arbor, Hartwick, Lewis and Clark, Hood, Hope, and Hiram Colleges. (The sources of the case descriptions are appended to the references list at the end of this paper.)

While the overall applicability of the structure model was the general proposition to be tested, this question was not by itself sufficiently definitive for research; it was therefore divided into a series of sub-propositions or questions aimed at examining several of the major linkages in the model. These questions included:

1. Can a general strategy be described for the institution, a strategy which embraces such strategic components as curriculum and

educational program, faculty and staff, facilities, admissions and recruiting, and the administrative structures and systems of the institution?

2. Is the strategy thus described internally consistent across the strategic components?

3. Does the institution have a clear and broadly accepted mission or purpose, and is the strategy thus described consistent with that mission?

4. Is the strategy thus described externally consistent with the characteristics and trends in the environment?

5. Is the strategy thus described consistent with the potential resources available to the institution?

6. Are the specific decisions made and actions taken by the institutional managers consistent with the general strategy?

7. Are there problems, both present and potential, which affect the operations of the institution, that appear to be related to inconsistencies in the general strategy or in specific decisions?

The questions shown above are essentially those employed by Hosmer in his research. In particular, it was a question like number 7 above which constituted the core of Hosmer's demonstration of the validity of the structure model. He states that:

> The existence of operational problems within an academic institution that could be traced to internal or external inconsistencies in the strategy of that institution would establish the value of the strategic concept to the academic administrator in directing or planning or influencing institutional change. (p. 1-6)

Generally, affirmative answers to the above seven questions would indicate that the concepts of the structure of industrial planning have been successfully applied to college planning, and would provide some of the needed supporting evidence for the prescriptions in the college planning literature. This is the first of our four research problems.

To answer the remaining three research problems, the actual planning procedures, organizations, and systems must be examined, and specific strategy-making incidents or episodes must be described. A number of questions were raised in this regard, among them:

1. Does the institution have a full-time planning officer? What is his function?

2. Does the institution have a permanent planning organization(s)? Who participates in this organization? If there are more than one, how are they coordinated?

3. Does the institution have a long range plan? How often is it reviewed and updated? How widely circulated is it?

4. How does the incident or episode being examined relate to the long range plan?

5. Who participated in this episode? Which segments of the institution were involved? Did they participate jointly or separately?

6. In this episode, to what extent was the relationship of this strategic issue to other aspects of the institution considered?

7. What were the alternatives that were considered during this episode? Were they known prior to the episode, or were they uncovered as a part of the analysis undertaken?

8. What environmental factors influenced this episode? Were these factors perceived as relatively benign or threatening?

From the answers to these questions it can be determined whether the institution operates a formal planning system or otherwise, and whether the synoptic process was employed in the strategy-making episode that was examined. Also, those situations or circumstances that tend to produce incomplete planning processes can be identified.

Research Observations

Reviewing the four research questions examined in this study, they are:

1. Are the concepts of industrial strategic planning also applicable to small college planning?

2. Does application of these concepts require a formal, highly organized, continuously functioning planning system?

3. Under what circumstances are college planners most apt to practice comprehensive or synoptic planning, and under what circumstances are they apt to deviate towards incomplete or non-synoptic processes?

4. What is the nature of these deviations?

From the data gathered concerning twelve representative liberal arts colleges, sufficient information for a test of the first two research questions was available for eight of the colleges. The data available concerning the other four institutions was insufficient as regards the first two questions, but was useful in testing the third and fourth questions.

Among the eight colleges thus examined, four fairly distinct patterns of planning practice were identified. The first pattern, found in four cases, exemplified the type of formal, highly organized, continuously functioning planning system that is so heavily prescribed in the literature on college planning. Indeed, the case descriptions of this pattern were found among articles and publications that typify the prescriptive literature. Since such formal systems were designed to fit the model of planning structures, it follows that they provide affirmation of the first of our four research questions. (The second question--whether formal systems are necessary--is irrelevant here.) Of course, we must assume that the case descriptions accurately describe the planning systems of the subject colleges.

That four of the eight cases examined were found to describe the operation of the formal systems prescribed in the literature does not, we feel, provide any clues as to the extent of adoption of formal planning by colleges in general. We cannot infer that anything close to half of all colleges employ such systems. Indeed, if we are permitted a guess, we would say that such formal systems represent a small minority of the actual planning practices employed by colleges in general, and that these case descriptions were published because of their relative uniqueness.

A second pattern, one which may very well be much more prevalent than the first, was clearly seen in one institution and suggested in the description of one other. This pattern is one that outwardly has the trappings and appearances of the formal, highly organized systems called for in the prescriptive literature, but where these planning systems are employed only in certain aspects of strategy-making and largely ignored in others. It is a pattern involving multiple modes as suggested by the Mintzberg article cited earlier. In these cases, the formal planning structures were employed for such year-to-year operational planning issues as budgets and staffing decisions, but were ignored for certain major decisions with longer range significance, such as facilities decisions.

The usage of a formal system for year-to-year operational planning, of course, affirms the applicability of the concepts of industrial planning. The real issue here is whether strategic decisions can be made outside of the formal planning system and still be consistent with the concepts of strategic planning structure. In one of these cases, the college decided to raise and spend several millions of dollars on the construction of a new athletics and recreation facility. This decision was made by the Board of Trustees unilaterally and produced considerable criticism and dissension among the faculty, including those who served on the nominal long range planning organizations. The essence of the criticism was that this expenditure was not consistent with the pressing needs of the college in meeting its mission. The reader should recall here that the principal question among those used to test the first research proposition is number 7, i.e., "are there problems, both present and potential, which affect the operations of the institution, that appear to be related to inconsistencies in the general strategy or in specific decisions?" As Hosmer pointed out, the existence of such problems "establishes the value of the strategic concept" in planning institutional change. The dissension or criticism of this facilities decision on the grounds of its inconsistency with institutional mission is an example of such a problem. We feel, therefore, that this case further supports the applicability of the concepts of strategic planning even where formal planning systems are superseded.

A third pattern, seen clearly in one of the institutions studied, was one where the normal governance or management system does not include a formal planning organization, but where ad hoc planning groups are created from time to time when a need is felt. This pattern would also include institutions which may have nominal planning groups in their organization structure, but where such groups do not routinely function or are dormant for long periods.

In the institution where this pattern was observed, soon after a new president was installed, it was decided to conduct a major institution-wide planning effort. Accordingly, a planning organization was created, which included representation from all of the constituencies of the college, i.e., trustees, administrators, faculty, students, alumni, parents, and the local community. Over the course of two years, the organization--through various sub-committees--produced a long range plan for the college, one which fully satisfies all of the consistencies and linkages called for in the model of the structure of planning. Enthusiasm for the project was high, and the resulting plan document was broadly accepted and widely distributed. It articulated a number of proposals and activities, all of which have been implemented in the six years that have passed since the project was completed and the organization disbanded. It remains the "long range master plan" for the college. Interestingly, however, only one of the college officials interviewed during this research was able to produce a copy of the "plan"; the others could recall it but had long since discarded their copies.

At the time of our investigation of this college, there was no great sentiment for a resumption of systematic planning. Since the long range plan discussed above was now six years old and was evidently no longer being used for guidance or reference, we sought to determine what the current general strategy of the college was. This was discussed with a group of key faculty members who seemed to feel that the college had no discernable strategy other than to continue to do what it has always done, only better. They declared that the college had a "no-strategy" strategy.

In his seminal monograph on strategic planning, Ansoff (1965) examined the question of whether an explicit strategy was actually necessary (pp. 112-118). In so doing, he listed the advantages of a "no-strategy" strategy. Briefly, the advantages were:

1. The firm would save the time, money, and executive talent which are required for a thorough strategic analysis....

2. The field of potential opportunities will be in no way restricted....

3. The firm reaps the full advantage of the "delay principle." By delaying commitment until an opportunity is at hand, it is able to act on the basis of the best possible information.

The disadvantages were:

1. No rules to guide the search for new opportunities.

2. Enhanced risks of making bad decisions.

3. No way to evaluate or control the overall resource allocation pattern.

4. The lack of an ability to anitcipate change.

Considering these disadvantages against the context of small college strategic planning, the "no-strategy" strategy or reactive strategy may very well be appropriate and useful. Unlike a conventional business, a college offers a highly traditional, rarely changing product. There are few changes in the technology of delivering higher education. Changes in either the external or internal environment are slow in developing and are generally easily anticipated. College administrators rarely are confronted by major decision situations. Indeed, one of the administrators interviewed commented that in this ten-year tenure, he has really made only two major decisions, both of which were personnel decisions--hiring a new Dean and a Business Manager.

As regards control of the resource allocation pattern, in small college operations there are few opportunities for changing or reallocating resources. The typical college budget involves almost entirely fixed costs, given the unchanging product mix, tenured faculty, debt service, and stable enrollments. New or expanded facilities are usually only installed after lengthy fund raising campaigns, during which the wisdom of the expansion is questioned repeatedly. Apparently, this very conservative strategy would seem to enjoy the advantages described by Ansoff without being appreciably vulnerable to the disadvantages.

This "no-strategy" strategy should also be examined using the questions employed to answer the first two research problems discussed earlier. As a strategy which involves little change from time-honored patterns and practices, considerable consistency is observed both across the strategic components and as regards resources and environmental influences and factors. It is a strategy built upon the aggregate of operating unit strategies (cf. Uyterhoeven, Ackerman, and Rosenblum, 1977, pp. 7-9), virtually guaranteeing internal consistency. As a predominantly reactive strategy, it is almost unavoidably consistent with environmental pressures and resource availabilities.

As to the existence of or potential for problems which may affect operations of the institution, these would probably have to be in the matter of the relationship of operating and strategic decisions and practices to the mission or goals of the institution. In the college in question, from time to time disagreements arose within the faculty and administration concerning such programs as business administration and the humanities. Some argued that the former does not belong in a "liberal arts" college; others decried the erosion of enrollments and course offerings in the latter. Decisions concerning staffing and resource commitments in these two areas could lead to problems--or at least to dissension. The stated mission or purpose of the school--a typical college catalog statement of mission--was vague and unhelpful in this regard.

Overall, however, the perceived strategy followed by this college seemed to be remarkably consistent with the basic strategic planning structure model described earlier. While this may be largely due to consistencies inherent in an inflexible institution following a mostly reactive strategy, or to the lack of opportunities for alternative activities, the applicability of the industrial planning structure model to educational institutional planning is clearly here supported.

The fourth pattern, observed in two of the cases studied, was one where no formal planning organization exists and where a single individual dominates the strategic decision-making processes. This individual may be dominant due to the power of his position, such as a president, or due to being actively involved in all of the groups, committees, or sub-systems which have strategic significance, such as a dean. In many respects this pattern is akin to the entrepreneurial mode of planning described by Mintzberg in the article cited earlier.

Cohen and March (1974), in their study of the college president, describe several models or metaphors of presidential roles and styles in terms of political systems. In terms of their metaphors, it would seem that this pattern is similar to a model they term a "plebiscitary autocracy." Of this style they say:

> The president is a decision maker and organizer of opinion. Such consultation or assistance as he uses is simply a convenience to him and imposes no obligation to him to follow the advice. He acts on the objectives as he sees them and subsequently attempts to persuade his constituency that his role should be continued. (p. 39)

College officials other than the president can effectively enjoy similar dominance by virtue of their extensive involvement in the various sub-systems within the college. In many small colleges, a dean or provost runs the institution while the president is primarily occupied with fund-raising, community or government relations, or inter-college commissions and organizations.

The issue here is whether an autocratic or "top-down" organization can perform the strategy-making function in a manner consistent with the concepts of the structure of planning. In such a situation, it would seem that the general strategy of the institution is whatever the dominant individual has in mind. In effect, he is the embodiment of the general strategy. Such a general strategy would therefore be internally consistent since the dominant individual personally supervises every facet of operations. It is consistent with perceived environmental factors since that individual is the institution's principal interpreter of environmental influences. It is consistent with specific decisions since the individual usually is the one who makes the decisions. It is usually consistent with available and potential resources since these are fairly fixed in small college operations, and it is this dominant individual who usually leads any drive for new resources.

It is in the matter of consistency with the mission of the institution that problems may arise under such an autocratic system. The autocrat, of course, has his own notion of the mission of the institution and runs it accordingly. However, particularly among the small liberal arts colleges, there is an implicit and accepted view of mission that is shared by most of those who staff such colleges. Although rarely clearly articulated, there is a general understanding of the role and purpose of such schools. The autocrat may find that his position is severely challenged if he were to try to move the institution in a direction that runs counter to this implicit notion of mission. This situation frequently arises in regard to business administration programs which are popular with students and financially lucrative, making them attractive to administrators who are trying to balance tight budgets. Liberal arts faculties, on the other hand, are often suspicious of such programs, feel threatened by their popularity, and frequently challenge their appropriateness as liberal arts programs.

Thus, while the actions and decisions of the autocrat would be consistent with his own view of the mission of the college, and would therefore affirm the strategic concept, if the autocrat were to attempt strategic changes that were inconsistent with the understanding of mission held by others in the institution, problems would arise. The potential for such problems also affirms the strategic concept because it arises out of an inconsistency. The reader should again recall Hosmer's principal test of the strategic concept: "The existence of operational problems...that could be traced to internal...inconsistencies in the strategy of that institution would establish the value of the strategic concept...."

Therefore, it seems rather clear, in a perverse sort of way, that even the autocratic pattern is consistent with the concepts of the structure of strategic planning.

The two remaining research questions are:

3. Under what circumstances are college planners most apt to practice comprehensive or synoptic planning, and under what circumstances are they apt to deviate towards incomplete or non-synoptic processes?

4. What is the nature of these deviations?

In order to answer these questions, cases describing eight of the sample colleges were examined, cases describing twelve distinct planning episodes or incidents. Here, we found that in six episodes, the colleges employed rather thorough and comprehensive planning processes, processes which observed all of the key linkages and interrelationships of the planning structure model. We have termed such processes "synoptic," using Lindblom's terminology.

In five other incidents, to some degree, the decision-making process ignored key linkages of the planning structure model or otherwise failed to practice synoptic planning. This resulted in a process that was incomplete to a greater or lesser extent. In the twelfth incident studied, the process began as synoptic, but due to circumstances which arose during the episode, the process became increasingly incomplete or non-synoptic.

Our research task is two-fold: (a) to determine what circumstances tend to produce processes which deviate from the synoptic, and (b) to characterize those deviations. Several writers and researchers have suggested relationships between situational variables and alternative processes. Some identify environmental and organizational climate factors as significant determinants of planning process. Others suggest that the nature of the alternatives themselves affect the processes that are employed in choosing from among them. Combining the suggestions of all of these writers, a model can be developed which has process as the dependent variable and a function of three independent variables: environment, the nature of the alternative, and organizational factors.

At the risk of oversimplification, if we eliminate organizational factors as a variable since we are examining institutions which are all quite similar in most organizational factors--except, of course, for organization for planning--we are left with a dependent variable, process, and two independent variables, environment and nature of alternatives. The environment can be viewed as ranging from benign to threatening, as perceived by the major participants. The alternatives can be characterized as either (a) unknown and therefore to be identified in the planning process, or (b) known prior to the planning process.

Examining those instances where non-synoptic processes appeared, the following observations were made:

A. When the strategic alternatives were readily apparent, the more the environment was felt to be hostile or threatening, the more likely the synoptic process was used.

B. When the strategic alternatives were not readily apparent, the more the environment was felt to be hostile or threatening, the less likely the synoptic process was used.

For example, one college embarked on a major fund raising campaign at a time when no particular environmental pressures were being felt. The description of the planning and operation of the campaign gives no evidence that anything other than the college's financial dimension was considered. In fact, most of the funding that was to be raised was to refinance debts incurred for construction and renovation projects already in place.

Another case described a series of reforms in such areas as budget, staff, curriculum, and recruitment and admissions, all of which were conducted sequentially, i.e., the administration gave its attention to those areas, one at a time, not moving to the next area until one was studied and reforms installed. These reforms were developed at a time of severe environmental pressures and without known options prior to the process.

A third college, feeling severe pressures from inflation and declining market population, undertook to examine both its educational programs and its recruiting activities, but with no coordination or communication between the two planning groups that were charged with these two projects. In fact, the two groups were specifically forbidden from sharing their findings or assumptions until their work was completed and proposals approved.

In another case, a major educational program was added to the curriculum with little or no consideration of its impact on enrollments or staffing. The program was added at a time when no particular environmental pressures were being felt. It has since become the major program operated by the school and unquestionably of strategic significance.

In perhaps the most interesting case, a major project was undertaken at another college, a project which set out to consider possible reforms of virtually every facet of the college, including curriculum, student residential life, governance, and recruiting. It was begun at a time when no particular environmental pressures were being felt. But during the course of the project, the environment became increasingly threatening and the project became one of curriculum reform alone, as the other aspects were abandoned. Thus, a planning activity which began as a synoptic process became non-synoptic as one of the situational variables changed.

It is significant that each of the above non-synoptic processes produced a strategic decision that has apparently been successfully implemented with beneficial results.

In developing his seminal theories of incrementalism, Lindblom characterized the process of analyzing and planning strategic change as a continuum ranging from the synoptic at one pole to the "grossly incomplete" at the other (1979). Towards the latter pole are a variety of processes including various forms of incrementalism, "seat of the pants" semi-strategies, and ill-considered, often bumbling incompleteness.

In our studies of the processes followed by our sample of colleges, three of the incomplete or non-synoptic processes observed seemed to be of the sort that Quinn (1980) calls "logical incrementalism." Here, sub-systems of the college perform strategy-making activities as regards their own areas, but are careful to integrate their analyses and plans with the needs and activities of others. There were, however, some instances of what might be termed "disjointed incrementalism," where planning activities were conducted in one aspect or sub-system of the college with little or no consideration given to the other aspects. No instances of "grossly incomplete" processes were found.

The process continuum that Lindblom suggested might therefore be thought of as having the synoptic at one pole, followed by logical incrementalism, then disjointed incrementalism, with the grossly incomplete at the other pole. More study is needed to determine the point on the continuum where the limits of satisfactory planning process lie.

Conclusions

Based on our study of the planning activities of twelve representative colleges, it would appear that the concepts of strategic planning structure developed for and employed by profit- and growth-oriented industry can also be successfully used by small, private, liberal arts colleges.

Furthermore, and perhaps more importantly, we found no evidence that application of these concepts requires a formal, highly organized planning system. The concepts of planning structure also seem to be successfully employed in informal, unstructured systems, or in ad hoc planning episodes, or even in institutions dominated by a single strong autocratic individual. The essential elements of the strategic planning concept are the interrelationships in the model and the consistencies between the strategy developed for the institution and its internal and external environments, its existing and potential resources, the specific decisions made by its managers, and its mission or purpose. While the purpose of the formal planning systems that are so heavily prescribed is to ensure that these interrelationships and consistencies are thoroughly considered, there is no apparent reason why these interrelationships and consistencies cannot be thoroughly considered by informal or ad hoc planning approaches, or for that matter, even by autocratic administrators. This we feel is important because formal planning systems are not only expensive to install, staff, and operate, but they also have a tendency to become an end in themselves with their procedures and paperwork becoming a bureaucratic chore.

Our investigations also provided some evidence that college planners may tend to deviate from processes that are fully consistent with the concepts of strategic planning structure under certain conditions of environmental pressures or whether the strategic alternatives are known or unknown prior to the planning effort. These departures seemed to be forms of incrementalism which, in the cases examined, did not appear to result in unsatisfactory or incorrect strategic decisions. Nevertheless, our findings in this area should serve to alert those who perform strategic planning for colleges that there is a tendency to depart from the preferred synoptic or comprehensive approach to planning when (a) alternatives are readily apparent and no particular environmental pressures are perceived, or (b) alternatives are not known in advance and environmental pressures are threatening. Whether the use of formal planning systems can prevent deviations from comprehensive planning under these conditions is not clear from the evidence.

We have been critical of the prescriptive literature on college and university planning because it offers its prescriptions generally without supporting evidence. Our purpose here has been to provide some of that evidence. While we feel that our findings generally support the applicability of industrial planning concepts to higher education, and therefore have strong normative implications, we offer our findings strictly descriptively and acknowledge that much more evidence is needed before conclusive proof can be claimed.

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Doctoral Programs and the Labor Market, or How Should We Respond to the "Ph.D. Glut"? Some Lessons from the California Experience

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Doctoral Programs and the Labor Market, or How Should We Respond to the "Ph.D. Glut"? Some Lessons from the California Experience[1]

Abstract

Cost-benefit analysis may be used as a heuristic framework for rationalizing the often confused thinking surrounding academic planning at state and multicampus levels. To illustrate the utility of this approach and to contrast it with prevailing approaches to program review and analysis, we have applied it to the termination or cutback of doctoral degree granting programs at the University of California. Our results show that this framework can be useful for identifying and analyzing data relevant to academic planning decisions. We also make some suggestions about how this kind of analysis can be promoted and ought to be used.

Introduction

For many years educators and many government officials concerned with higher education policy in California (and elsewhere), faced with a burgeoning demand for graduate education and its products, seemed to assume that more and bigger graduate programs were worth whatever they cost. The real constraint on growth was not demand or even currently available funds, but the ability to build buildings, hire faculty and organize programs quickly enough. Now, the need for more and larger graduate programs, or even all of the existing programs and students, appears to be much reduced relative to other demands for resources. There is much more interest in costs, "unnecessary duplication" of programs, and cost savings possibilities.

This set of concerns suggests the applicability of a cost-benefit analysis approach. Analytical difficulties resulting from the numerous interdependencies and jointness problems that characterize graduate education and difficulties in measurement on some of the dimensions of interest [2] render the rigorous application of the approach infeasible, at least at present. However, the basic ideas underlying the cost-benefit approach turn out to be very useful heuristically in rationalizing and integrating the usual disjointed thinking in this problem area.

The Benefit Side

The various issues often conceptualized by educators under the rubric of "needs"--labor market demand for program graduates and "societal needs" for graduate programs and their products, "needs" arising from student demands for admission, "institutional needs" for graduate programs and students to assist in accomplishing other institutional missions, concerns about "unnecessary duplication," even quality concerns--can all be conceptualized in terms of the benefits concept. The need concept conveys the misleading idea of an all or nothing choice--a program is either needed or it is not--while the benefits concept facilitates the analysis of the utility of increments (or decrements) of benefits and their relation to incremental (decremental) costs. We now consider how the several dimensions of "need" in regard to graduate education can be analyzed within the benefit-cost conceptual framework.

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[1] This paper is largely based on [37]. The author would like to thank Fred Thompson for helpful suggestions regarding this paper and the earlier study.

[2] For a comprehensive discussion of these problems, see [20], also [27].

Labor Market Demand

Human capital theory [3], [24] provides a useful conceptual framework for assessing an important class of benefits resulting from graduate education. Normatively, the theory tells us that program and enrollment decisions should respond to signals from the labor market. When job opportunities and starting salaries for graduate degree-winners in a particular field increase relative to those in other fields, capacity should (ceteris paribus) expand for these market signals imply that the social return on investment in graduate training in the field is increasing. From the standpoint of graduate program planning and decision-making, this means, of course, that indicators of job market strength should be monitored and taken into account in program and enrollment decisions. But this seemingly straightforward prescription can be quite difficult to interpret properly. [3]

The most obvious and specific market indicators--types of job placements and starting salaries of program graduates--are useful but inherently limited guides for program and enrollment decisions. For proposed new programs there are no directly relevant placement data (though data from similar programs already in existence can help give some sense of the market). Where placement data are available--and remarkably, they are often not collected systematically at present--they still cannot tell us about the future for which we are planning. Labor market conditions can change drastically in the five or more years required for most entering graduate students to complete the doctorate.

Labor market projections, the obvious answer to this difficulty, tend to be crude and difficult to interpret from the standpoint of individual program decisions. In only a few fields are methodologically adequate projections available at the discipline level, and these are often one-time analytical studies by academics, not regularly updated, widely available reports. [4] In general, projection analysts make little attempt to model critical macroeconomic, political or market response variables; thus even their "best guess" projections often do poorly as predictions. [5] Also, the projections are little informed by any systematic study of recent adaptations--in the present case to apparent "oversupply" of doctorate-holders--or by any serious analysis of where

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[3] See [11a] for an excellent discussion of some of the analytical problems involved.

[4] See, for example, [12] and [13]. The National Science Foundation has published Ph.D. supply and demand projections for science and engineering every four years or so for the last decade [32] [33] [34] [35] and these have become increasingly sophisticated. But the field categories used in these projections are still quite broad (engineering, physical sciences, life sciences, mathematics, and social sciences).

[5] This is not to say that the task of modeling these disparate and complex processes is easy. Also, it should be noted that efforts to model market response processes are in progress. See [33] [14].

[6] The author is presently studying aspects of these questions as part of a national study of the changing role of postdoctoral education. For a progress report see [36] and [36a].

"enrichment" ends and "underemployment" begins.[6] In many fields, evidence of substantial underemployment of Ph.D.-holders was less than clear as late as 1979 [17], the latest year for which currently available survey data have been published.

We should work to improve the quality and timeliness of market projections for they are essential for good decision-making at all levels. These projections, together with a seasoned assessment of a program's "strategy" and its ability to execute it successfully, are all that we have to forecast market-related benefits. Fortunately, strategies and allocations can be modified as time goes on *if* up-to-date placement and market forecast data are available.

Student Demand

Overall graduate applicant demand to University of California programs continued to grow in the early seventies. This caused some concern at the state level, for there might be considerable opposition to efforts to cut back program and enrollment plans on labor market grounds if student demand remained strong. Not surprisingly, however, the author's subsequent investigation showed that, in general, on a program-by-program basis, applicant demand in the arts and sciences fields was declining.

Application patterns over time seem to be generally consistent with the tenets of positive human capital theory. That is, students tend to turn away from fields where they perceive that the return on their investment in graduate education is declining, and to maintain or increase interest in fields (such as medicine and business today) where the return on investment is stable or growing. Thus applications trends by field are one useful barometer of labor market developments, although there are some important caveats that must be kept in mind in using them for this purpose.[7]

In most University of California departments at least (and most other universities would probably report similar experience) there would appear to be no serious conflict between the general policy prescriptions of a policy based on apparent market demand trends and one based on student demand. In cases where applicant demand remains consistently high in the face of clear evidence of weak market demand for graduates, decision-makers must decide just what it is worth to try to meet student demand that does not appear to be justified by labor market demand. If other, non-market-related benefits of additional enrollments (such as those discussed below) are negligible and expansion is costly, most government officials, probably consistent with the priorities of most of the electorate, would likely judge the benefits of expansion not worth the opportunities foregone.[8] Where the issue is whether existing programs should be cut back in size if student demand exists but market forecasts are bleak, 9 the problem tends to be more complicated, as we shall see in the following sections.

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[7] In particular, there are problems with student information, in some fields especially; lags between market changes and student responses; factors, such as broad changes in student values and tastes, essentially unrelated to the labor market that influence patterns of student demand; and, if application trends are used explicitly in administrative decision-making, problems with integrity and comparability of applications data.

[8] Although it should be remembered that costs to the public purse could be reduced by raising net fee levels in such fields. Such a policy could both test the seriousness of student demand and provide some resources to finance expansion.

[9] It seems likely that most such problems would disappear in time, especially with the aid of field-specific market projections and the provision of data to students about the costs and risks of graduate study. We will have more to say on this point later.

Benefits Resulting from Impacts on Other Institutional Missions

Under current circumstances in the markets for students and program graduates, it is quite clear that neither student nor market demand is adequate to justify some graduate programs, at least not at their present or planned size and cost. Yet, universities continue to argue that substantial graduate programs in a number of low-demand disciplines are "needed." Do these arguments have any substance or are they merely self-serving apologies for avoiding the pain of desirable retrenchment?

Again the benefit-cost framework is helpful. The academics' argument is essentially that strong graduate programs, usually at the doctoral level, are necessary for an institution to serve its other missions on behalf of the public effectively. Most fundamentally, the argument is that without a range of strong doctoral programs, the institution will be unable to establish the intellectual climate and reputation necessary to attract a quality faculty. Without a quality faculty it will not be able to serve any of its purposes satisfactorily.

For some kinds of institutional missions, this line of argument may make considerable sense, up to a point. If one of an institution's missions is to insure that a doctoral program of high quality is available in the state in every recognized field of learning and scholarship at public university tuition levels, then it may be necessary to maintain substantial departments somewhere in the institution in some fields where demand alone would not justify them. If wide-ranging basic research is part of a campus's mission, doctoral programs in the basic disciplines will almost certainly be necessary. If it is regarded as part of the institution's mission to be prepared to respond expeditiously to societal demands for research and highly-trained people, it may be necessary to sustain capacity in fields where new needs may develop suddenly that would not be justified on the basis of current demand levels. And, some would argue that the commitment to provide extensive graduate professional education requires a large complement of high-quality programs and faculty--which would usually imply doctoral programs--in the underlying disciplines. Indeed, some would argue that quality and "campus balance" by definition require that doctoral programs of substantial size be maintained on each campus in all the basic disciplines at least.

Certainly policy-makers must consider the impacts of decisions about doctoral programs and their size on other institutional missions. However, there may be other ways to achieve some of these goals that do not require the maintenance of substantial resources in doctoral education that would not otherwise be justified. For example, there is ample empirical evidence that high quality in doctoral education can be achieved by departments with relatively small complements of both faculty and doctoral students.[10] The key to such success with limited resources is careful planning of faculty hiring and academic specialization.[11]

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[10] This was a major finding of the American Council on Education's widely publicized studies of quality in graduate programs [8a] and [22].

[11] See [37, Chapter Six].

Another case in point is the problem of planning so as to be prepared to move expeditiously into areas where urgent new societal needs, student demands or important intellectual developments may occur. In a multicampus university, this is a system objective; it is not necessary for each campus to be prepared to gear up quickly in each area of knowledge. Moreover, it is possible to identify broad areas of study where such developments are more likely and more likely to result in large benefits if they are seized upon quickly (and in large social costs if they are not). Generally speaking, it is in the natural sciences and engineering where shortages of highly-trained people are most likely to develop suddenly and where such shortages are likely to have the highest opportunity costs--e.g., lost opportunities in medical or industrial research applications--or immediately catastrophic consequences--e.g., in the case of failures to develop alternative energy sources or earthquake prediction capabilities rapidly enough. Hence the argument for maintaining capacity in excess of evident demands is stronger (at least on the benefits side) in some of these fields, and academic planning should take this into account.

Finally, higher education policy-makers should not regard statements of institutional "missions" as written in stone. Institutional goals can and ought to be reconsidered and appropriately redefined as conditions change. For instance, the goal of providing academic programs on the doctoral level in every field of recognized scholarly importance might be modified in light of stringent fiscal circumstances. The state could seek to provide the educational opportunities for its citizens implied by this goal by negotiating with private institutions in the state or with a public institution in a nearby state to subsidize the attendance of qualified students enrolled in a program not available in the state's own public university system.

Another possibility for multicampus systems would be to redefine, at least for some years, the missions of one or more campuses currently supposed to emphasize research and doctoral education. In analyzing such a proposal, the significant economic benefits of academic research[12] should of course be considered and the campus strategy for developing or maintaining successful doctoral programs carefully assessed in light of the data available. The presence of graduate professional programs on a campus may well justify some doctoral programs in underlying basic disciplines, but the number of disciplines required for any one professional program will be limited and large-scale doctoral programs should not be necessary on this ground alone.

Finally, in some states it can be argued that reducing the number of research and doctoral education-oriented campuses limits undergraduates' opportunities unduly. The argument here is that students generally have many more choices of institutions devoted primarily to undergraduate education than they do of institutions with a research-oriented intellectual climate. Perhaps in some states such opportunities should not be further limited. Certainly this consideration should not be dismissed out of hand.

Benefits of Competition and Diversity

A few additional considerations that may have genuine merit in support of developing or maintaining doctoral level programs on several campuses should be noted. First is the matter of the benefits of competition. We hear much about the evils of duplication of programs in higher education (and other public program areas), but little about the benefits that can result from competition among programs. Recent theoretical work, including some concerned specifically with higher education, suggests that if revenue schedules are properly designed, competition may bring substantial efficiency benefits under some circumstances [19] [26] [28] [29].

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[12] See for example, [23].

One important benefit that some "duplication" of programs in the same nominal field may bring is diversity of focus as departments seek to differentiate their "product." This gives students and sponsors more choice and probably improves responsiveness to student and societal needs and intellectual developments. Less-established programs are probably likely to be more innovative as they look for their place in the sun.

These points merit careful analysis when decisions are made about campus plans in specific fields, but it must also be remembered that no state university is an island. The requirements of adequate competition and innovativeness may be well served in some instances by virtue of the presence of similar programs in private institutions or in nearby states.

Benefits and "Quality"

Educators and higher education policy-makers have always talked a great deal about the importance of "quality" in educational programs. This traditional concern with quality has survived into the present period of heavy emphasis on programs. Indeed, some quality threshold is often established that must be crossed, in theory at least, if a program is to "pass" a program review.

Unfortunately, the emphasis on quality has often been too narrow and otherwise inappropriate for guiding the efficient allocation of resources. Many doctoral program quality assessments done within institutions or by outside professional bodies focus almost entirely on input and process concerns--i.e., on the apparent adequacy of various kinds of resources, curriculum and organization, student qualifications, etc.--rather than the results and impacts of the enterprise. To the extent these input and process variables are related to results and impacts, there may be no problem, but the nature of the relationship in many cases is far from clear.

One notable exception to this line of cririclsm is in the area of research. Virtually all quality assessments of programs at the doctoral level--and especially the national ratings that are published from time to time and which have considerable influence with state officials and the higher education community--give close attention to the research capabilities of the department under scrutiny. This is clearly important for any assessment of the research and intellectual contributions the faculty, students and graduates are likely to make, and hence for evaluating one very important dimension of the benefits of the program.

But graduate programs have other objectives, and hence may produce other kinds of benefits. These are frequently given short shrift when some arbitrary standard of "academic quality" based primarily on conventional input and research criteria is applied as a threshold that must be crossed by each program that is to survive.

Certainly at the Master's level graduate programs can serve useful purposes and markets (i.e., can have benefits) that are not necessarily reflected in quality assessments based on a strictly research-oriented model. Even at the doctoral level it is worthwhile to look at the actual performance of "lesser quality" doctoral programs in terms of the quantity and impact of the applied research and professional work they do, the career success of their graduates, and their success in attracting students before concluding that they should be eliminated for lack of "quality." It is clear that some doctoral programs serve different purposes and different markets than those at Harvard and Berkeley [8] [25] [37]. In many cases, it remains to be shown that this service is not worth what it costs, at the margin. Clearly the market--for graduates, for research and professional services of faculty, and the competition for students--should be an important test of a program's quality.

The Cost Side

All the considerations and data on the benefit side of any program or enrollment level decision must be weighed as a package against the costs associated with the decision at the margin. This last point seems to be a difficult one for many higher education decision-makers, including those at the state level, to understand. Perhaps owing to the design of university cost accounting systems and the pervasive use of formula-type budgeting tools, decision-makers sometimes overlook the fact that incremental (or decremental) costs (and benefits) may differ sharply from historical average values. The various interdependencies and other complexities on the benefits side of decisions about doctoral education were discussed in the previous section. There are similar complexities with respect to costs, which we consider below. Ignoring these complexities will almost always lead to misallocation of resources.

Under present circumstances it is common for state-level policy-makers and budget officials (and sometimes university admministrators) to overestimate the costs of new graduate programs and enrollment increases, and to similarly exaggerate the savings from program and enrollment retrenchment. In the current environment, most academics have learned that new doctoral program proposals must be designed to utilize, to a large extent, existing campus resources if they are to have any chance for approval at higher levels. Thus many proposed new programs these days are interdisciplinary in nature and often seek to utilize resources already available on the campus or on a nearby campus or research facility. In these circumstances, a considerable number of new students may sometimes be accommodated in existing courses and facilities with little or no increase in faculty,[13] library, and other costs. Similarly, proposals for new doctoral programs are often "piggybacked" on existing Master's or, occasionally, graduate professional programs.[14]

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[13] Linkages with research programs, particularly in the natural sciences, will often provide access to postdoctoral research associates who can to some extent substitute for faculty, especially in supervising graduate student research.

[14] Indeed, arguments of this kind can be so seductive when made by "experts" in a field to generalists who review proposals that review processes need to beware of the "foot in the door" tactic of resource acquisition used by program proponents. The proposal is sold initially as being virtually costless but turns out to be quite expensive as the program develops. Independent but expert consultants in the review process can help here. The key analytical issues in regard to costs are the validity of the assumptions about the starting point (for example, research programs counted on for key support may be supported mostly by unreliable "soft" money), and the need to be fully aware of how far the department or institution really plans to try to go in developing the program to its own "standards of quality."

Equally important is the fact that increased graduate enrollments in a department without graduate students or with relatively few graduate students per faculty member can help pay for themselves via cost-of-education allowances sometimes attached to graduate fellowships and via input substitution.[15] The latter occurs when a department substitutes much cheaper graduate student assistants for faculty in some teaching and research tasks, thus freeing existing faculty for graduate teaching and revenue-generating activities like preparing research grant proposals.[16] Unless a department already has a large number of graduate students, increased numbers will normally add to its research productivity and thus to its reputation and its attractiveness to students, research-supporting agencies, and other sponsors. Also, it should be noted that adding modest numbers of graduate students to a department with an existing doctoral program may not necessitate adding faculty if the students can be accommodated in existing courses and current faculty can handle the additional advising load. These subtle cost considerations need to be explored carefully (but often are not), for they can sometimes reduce the net incremental costs of enrollment expansion far below historical average costs.

On the negative side, some of the same considerations tend to reduce cost savings possibilities from program and enrollment cutbacks well below what one (for example, a state budget official) might expect on the basis of historical cost data. Graduate enrollment cutbacks reduce revenue and, where most graduate students are employed as part-time research and teaching assistants,[17] will probably reduce research productivity (thus reducing revenue potential and making it more costly to attract good faculty) and increase the average cost of teaching undergraduates. Given that high proportions of faculty in most departments are tenured and that some provisions almost certainly have to be made for maintaining an intellectual "critical mass," enough faculty to cover the various subfields of each discipline, and to provide for bringing in some "new blood," there may be very limited possibilities for substantial cost savings short of abandoning programs entirely or accepting sharply reduced quality. Even if abandonment seems justified on grounds of low current benefits, substantial cost savings take several years to materialize as even most untenured faculty have multi-year contracts and there are students "in the pipeline" who must be allowed to complete their programs. The substantial savings that could accrue from the release of tenured faculty are subject to large political and legal uncertainties.

Finally, in some fields at least, it is worth considering the possibility that, before significant cost savings have materialized, it will be necessary to gear up graduate programs again to meet new demands. Analysis should seek to assess where this is a serious possibility and weigh the net costs of maintaining some excess capacity for a time against the costs and difficulties of gearing up rapidly in a context of urgency where others would also be bidding for faculty and students.

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[15] For a full development of the argument regarding input substitution, see [10].

[16] Extramural research funds generally provide the university with substantial unrestricted income beyond the direct costs of the project. Research funds can also pay portions of faculty members' salaries and support graduate students and provide them with training opportunities, thus relieving the university's general budget of these costly burdens. Research funds may also pay for postdoctoral associates who can relieve faculty of some current teaching or at least reduce the need for more faculty.

[17] This was found to be true at many of University of California's developing campuses, where graduate students tend to be scarce relative to faculty demands for them.

Policy Analysis and Recommendations Concerning Doctoral Education at the University of California

The study on which this paper draws [37] gathered and analyzed extensive data on each of the elements indicated in the policy analytical framework presented above. The findings and conclusions on the key issues are summarized below. The findings were a mixed bag--overall, not what either side claimed or expected.

Review of the then-extant Ph.D. supply and demand projections [1] [9] [30] [32] suggested a generally bleak prospect for substantial numbers of doctorate-winners for some years to come (at least through 1985) if they all sought the types of jobs traditionally filled by Ph.D.s.[18] However, these analyses did not take into account in any systematic way the likelihood, effects, or desirability of market adaptations--in particular, in regard to types of placements--to the relative abundance of Ph.D.s, or the probable effects on placements of major shifts in research and development spending patterns. Moreover, no distinctions were made regarding prospects for Ph.D.s from institutions of different status levels. Since these matters are of major importance for sound decision-making about doctoral programs, the projection sutdies were of only limited usefulness for the purposes of the study.

Exhaustive analysis of Ph.D. placement trends from hundreds of University of California departments on six campuses in the full range of arts and sciences fields and engineering was undertaken.[19] The available data had important limitations and findings differed substantially across fields and campuses [see 37]. But in general, in the sciences and engineering there was virtually no evidence of unemployment of UC Ph.D.-winners and little unambiguous evidence of significant underemployment, although new Ph.D.s did seem to be taking longer to find jobs. Some signs of market adaptation seemed to be showing up as more Ph.D.s moved into what had formerly been unusual types of professional jobs for them.[20] In the humanities fields the picture for the new Ph.D.s seemed to be considerably bleaker with fewer signs of apparently successful adaptation, and more indications of prolonged unemployment and likely underemployment.

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[18] It should be noted that more recent projection studies [6] [21] [33] come to essentially the same conclusions and share essentially the same limitations as the earlier ones.

[19] The major source of data was the National Research Council's annual Survey of Earned Doctorates, which collects data from virtually all doctorate-winners from U.S. universities at the time they file their Ph.D. dissertations (see [18]). Data were also collected from a number of individual doctorate-producing units in the University of California.

[20] Data on Ph.D. employment nationwide indicate that this trend has accelerated since the middle seventies [17] [18]. While the available data on this are helpful, the job and employer categories are too crude to permit the kind of deep study that needs to be done of the character of the new kinds of jobs Ph.D.s are taking and of their performance in them.

The analysis revealed unexpectedly small differences between Ph.D.s from departments of different quality levels in the likelihood of securing an apparently professional position upon graduation. The small magnitude of the differences seemed to be due to the fact that Ph.D.s from different types of institutions entered different markets. The prevailing trend was not, as many in the University of California had expected, "displacement" of Ph.D.s from lesser institutions by those from more distinguished institutions in faculty jobs at lower status campuses, community colleges or secondary schools. Rather, more science and engineering Ph.D.s from all status levels were moving into research or other kinds of nonteaching professional jobs. Examination of the placement records of the departments at the "developing" UC campuses indicated that most departments' Ph.D.s seemed to be holding their own in finding professional-level jobs in academic research, government, industry, the nonprofit sector or consulting.

Analysis of available, mostly conventional, indices of quality of doctorate-granting departments at the developing campuses showed that few were of embarrassingly poor quality by these standards, and that such trends as could be discerned from the available indices were generally positive. Many departments, it was discovered, had apparently seen the futility of imitating Berkeley and were trying to implement a more selective development strategy. Examination of application trends in several fields on four of the developing campuses through the 1973-74 (in some cases 1974-75) academic year showed that in most programs, applications were level or declining, and many programs appeared to be accepting nearly all qualified applicants. This fact, together with the thin fiscal diet being provided by the state,[21] made substantial graduate enrollment increases in the foreseeable future seem unlikely.

The very limited new resources available meant that the University could not fund new programs or enrollment expansions on its own without terminating an existing program or taking advantage of the kinds of complementarities between graduate education and other departmental activities mentioned earlier. Analysis of teaching, research and graduate enrollment configurations at the developing campuses indicated that net costs of modest increases in some departments would probably be low and benefits substantial. Where qualified and properly informed applicants were available, it was concluded that enrollment growth should not be opposed by the state. A similar conclusion was drawn regarding new programs brought to the California Postsecondary Education Commission for review, as long as these were to be funded from savings achieved elsewhere within the University. Where net increments to graduate enrollments (and thus to enrollment-linked state resources) system-wide were anticipated, a full-scale analysis of costs and benefits along the lines proposed earlier, and involving the University, the Department of Finance and the Postsecondary Education Commission, would be called for.

The approach and broad conclusions of the analysis of the cost savings potential, i.e., the benefits, of graduate program and enrollment cutbacks was outlined earlier. Basically the conclusions were that savings in the short run were likely to be very small; that savings in the longer run depended in a number of fields on uncertain future needs that would be very costly to meet once programs had been sharply cut back; and that there were likely to be substantial costs on a variety of dimensions associated with major retrenchments. Thus the overall conclusion from the analysis of the University of California situation was that programs in fields where new demand could well arise in the foreseeable future[22] should not, in general, have resources cut back until there had been several years of very weak applicant demand. In fields such as many of the humanities disciplines where market demand was clearly very weak, and likely to continue to be so, and the applicant pool very thin, some substantial enrollment cutbacks seemed to be called for (though resource savings would generally be modest except perhaps in the very long run). Even here given the University's mission in terms of quality of scholarship, there seemed to be little point in terminating doctoral programs entirely in most cases since the presence of even a few (properly informed, of course) doctoral students in a department has substantial benefits and need not be costly.

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[21] In particular, by the early 1970s the state had stopped weighting graduate students more heavily than undergraduates in assessing the University's budgetary needs.

Who Is to Do What?

There has been an undeniable increase in recent years in government's demands for more accountability on the part of the universities [11] [15]. Essentially this means more information about and more control over the plans and spending of the institutions. Doctoral education is a central concern of those who believe the universities spend too much money and spend it in the wrong places.

On many issues, and particularly these days in the planning and review of graduate programs, the state and institutional perspectives conflict. The state government is in the better position to weigh the claims of higher education against other claims, including those for tax relief. The institutions undeniably have vested interests to protect and no doubt the same exaggerated view of the importance of their own activities as other organizations. But their considerable independence, breadth of perspective, and large stock of expertise give them a unique capacity to take the long view of societal needs and opportunities. This is a role that no governmental or other major institution in society plays very effectively. A considerable danger in the present context is that state officials will give too little weight to long-run and hard-to-measure benefits considerations in their haste to save money now.

More influence might be gained for the universities' perspectives on these issues if they were somewhat more insulated from immediate political pressures. Moves in this direction, however, are probably infeasible politically in most states and may invite a lack of responsiveness to legitimate public concerns on the part of the institutions. Indeed, one must have considerable faith in both the wisdom of academics and the broad congruence of academic and public values to urge, within a democratic philosophical framework, further insulation than obtains in, say, California, under current constitutional arrangements.

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[22] It should be noted that, in addition to large uncertainties on the demand side, annual U.S. Ph.D. output in many science and engineering disciplines has declined substantially since the early 1970s [18]. Thus, large increases in demand may not be necessary to produce perceived manpower shortages. In engineering, for example, doctorate output has declined some thirty percent in the last decade [18], which explains in large part why relatively modest demand growth has produced a serious scarcity of Ph.D.-trained engineers today.

Short of major structural change, then, one can only urge that state-level policy-makers see the wisdom of leaving most decisions about programs, enrollments, internal resource allocation and management to the institutions within a politically-determined overall budget constraint and with some monitoring of the institutions' decisions. An incentive structure that permits maximum decentralization of allocation and management decisions is particularly desirable in a university, both because it is most consistent with the valuable tradition of academic autonomy, and because it places decisions about the unusually specialized activities in the disciplines in the hands of those with the most relevant knowledge. As long as state resources are linked to enrollments, we can be assured that enrollments and enrollment prospects will play a considerable role in program development, program termination and resource allocation decisions. This in turn assures attention to student interests and thus, as long as students are well-informed, to societal needs, market demands, and intellectual developments, which tend to be intercorrelated and to which students do respond. It encourages departments and campuses to think entrepreneurially, to develop and execute strategies designed to find and exploit intellectual market niches, the success of which can be subsequently evaluated. Such a funding arrangement also applies pressure on the institution to move to terminate programs that consistently fail to attract students. As long as some resources are provided on a more discretionary basis, the institution should, as is appropriate, have some capacity to subsidize programs it sees as important in spite of low enrollment.

In such a setup, the state government's role should be to see that prospective graduate students are provided with the best available objective information about the costs, risks and likely benefits of matriculation in the graduate programs they are considering. This should substantially increase the degree to which student demand trends reflect shifts in societal needs. The state should also monitor, publicize and comment on institutions' performance--where possible, relative to other comparable institutions--in such areas as responsiveness to student and market demands, efficiency in the use of resources, and program quality. The state's control over the largest part of the universities' discretionary income will insure that the institutions pay attention to legitimate state concerns.

These steps are probably as far as the state can efficiently go in seeking accountability from its public universities, whether in graduate education or in other spheres of activity.

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